

MARINE REVIEW.

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No. 6.

The New Ship Canal Commission.

It is expected that the new commission of engineers, appointed recently by President McKinley to make surveys and examinations for a deep waterway between the great lakes and tide water, will hold a meeting and map out a programme as soon as the members have received the necessary orders from Washington. This commission is to continue investigations begun by the Deep Waterways Commission, which reported to congress a few months ago, and of which Mr. L. E. Cooley of Chicago was a leading member. The failure of the president to reappoint Mr. Cooley to this work is generally regretted, and nobody seems to understand why he was not appointed, in view of the numerous endorsements which he received from commercial bodies, and all of them unsolicited.

Members of the new commission are all well known, and all of them have had years of experience in a kind of engineering work that specially fits them for this service. They are Major Charles Raymond of the army engineer corps, now at Philadelphia; Geo. Y. Wisner of Detroit, and Alfred Noble of Chicago. Mr. Wisner is so well known to readers of the Review that no introduction is necessary in his case. His connection with this board may result in some important information being submitted on the subject of regulating the level of Lake Erie by a dam at Niagara. Major Raymond is one of the ablest engineers of the army corps. Mr. Noble is also one of the very best men that could be selected for this work. He was a member of the old Nicaragua commission and was a candidate for reappointment on the new commission, which place was recently given to Prof. Haupt of Philadelphia. Referring to this latest appointment he said:

"My own appointment on this board was a great surprise to me, and I doubted its correctness when I read it in the newspapers. Since then, however, I have received a letter from Major Raymond which confirms it. I was not an applicant for the place and was urging the claims of Mr. Cooley, whom I was anxious to see appointed. I suppose we will take up this work where the former commission, of which Mr. Cooley was a member and Dr. Angell president, left off. That commission examined into the practicability of the several routes suggested, between the Hudson river and Lake Erie, and it will be the business of our board to make surveys of the various routes and report as to their respective cost and availability."

Lake Freight Matters.

Although official figures are not as yet at hand, it is certain that iron ore shipments to Aug. 1 are a little in excess of 5,000,000 tons, or almost equal to the aggregate on the corresponding date a year ago. It will thus be seen that the movement of ore has been very heavy, notwithstanding numerous drawbacks. Ore shippers have been taking advantage of the low freights that have ruled on account of decreased shipments in other lines, especially soft coal. In hard coal also there is a falling off, as the shipments from Buffalo to Aug. 1 aggregate only 708,408 tons, or a shortage of 190,000 tons as compared with Aug. 1, 1896. The only hope of vessel owners, who have been carrying all kinds of freight since the opening of navigation at the lowest rates ever recorded, is that the immense grain crop will crowd a heavy business into the last two months of the season, and that a shortage of coal in the northwest, due to the strike, which is not yet settled, will also increase the demand for vessels towards the close of the season. Chartering of vessels on the Atlantic seaboard to take export trade has been very heavy during the past two weeks, and it is expected that this condition will continue for some months, as great prosperity in business is reported from several of the European countries, especially England.

There is some unfavorable comment regarding the appointment of Rear-admiral John W. Walker, U. S. N., retired, to the new Nicaragua canal commission. One of the eastern trade journals referring to this appointment says: "It was quite apparent to those who were posted that the house bill creating the commission, which required an engineer officer from the navy, was modified in the senate purposely to permit of the appointment of Admiral Walker, who is a line officer of the navy, retired for age. Undoubtedly he is a good officer, but his training has not given him any special fitness to investigate the formidable engineering questions which arise in this project. Moreover, his age is a great drawback, as it will be impossible for him to undergo the physical exertion necessary for a thorough examination of the country. Capt. O. M. Carter was graduated from West Point in the class of 1880 and entered at once into the corps of engineers. He is a sound and competent officer and will be a valuable member of the board. Professor Haupt of Philadelphia is also a graduate of the military academy, but has been for many years in civil life. He has the same relative position in this board that Mr. Noble of Chicago had in the former board."

The Delaware River Ship Building Co. of Chester, Pa., has just closed a contract with the Brooklyn & New York Ferry Co. for a steel ferry-boat of about 190 feet length. This is the sixth ferry to be built at Chester for the New York company, but this one will differ from the others in that she will be of steel instead of iron. Heretofore these vessels have been of iron throughout, the owners of them believing that this material resisted the corrosive influence of the sewage and refuse in the East river better than steel.

G. A. R. encampment at Buffalo, N. Y.—The Nickel Plate road sells low-rate excursion tickets Aug. 21, 22 and 23. Tickets may be extended to Sept. 20.

232, Aug 21

To Solve the Mississippi Flood Question.

At the recent Transmississippi Congress, held at Salt Lake, a suggestion was offered calculated to present the big problem of solving the river question in a new light, and perhaps offering the real solution of the vexed difficulties of floods, impediments to navigation and channel-making in the Mississippi river. Daniel H. Solomon, the well-known lawyer, author and traveler, prepared the document, and he takes the position that all efforts made thus far to master the conditions of the Mississippi river have been aimed at the effects and not at the cause of all the trouble. As is well known, the Mississippi river is the final channel to the sea for fourteen of the greatest rivers in the country. They rise thousands of miles apart on both sides of the Father of Waters, flowing, in some instances, through arid regions, and aiding to produce almost annually the flood conditions which menace life and property and hinder navigation along the Mississippi river. Mr. Solomon's idea is that Congress shall pass a law compelling the various states and territories through which these long tributaries wind to prevent them from pouring into the Mississippi river at inopportune times, and requiring that these surplus waters be confined and restrained by the various states and territories through which they pass.

"Such a law, if passed," said Mr. Solomon, "would mean the erection and maintenance of hydraulic works for the interception and detention of this surplus water at points far distant from the Mississippi, and in western and southwestern territory, where the irrigation problem is still in its infancy, the placing of such a project into the hands of the several states and territorial governments would make it a mighty adjunct to the titanic work of reclaiming arid lands. The diversion of surplus waters over rainless districts would be simplified, and the theory is that the intricate problem of successful irrigation, and the still more vexed question of handling the navigable rivers of the interior and Mississippi rivers would be solved at once and for all time by the passage of a suitable law by congress, which, under the commercial clause of the constitution, is empowered to make such legislation. At the same time it would necessitate the co-operation of every state and territory which is drained into the Mississippi. Instead of attacking the effects of the cause with temporary and expensive methods that are neutralized or destroyed as often as they are completed, my plan is to attack the causes in the manner outlined, and by handling the origin of all the trouble, not only settle the river question, but aid those who would be compelled to co-operate in benefiting their own lands and people simultaneously."

In the 2,400 miles' length of the Mississippi river, fourteen great rivers are more or less responsible for its unmanageable and threatening conditions. From the west come the Minnesota, Iowa, Des Moines, Missouri, St. Francis, Arkansas and Red rivers, each with its own great tributaries reaching far out into the Rocky mountains. From the east come the St. Croix, Chippewa, Wisconsin, Rock, Illinois, Ohio and Yazoo, with all their tributaries. Besides these chief rivers, there are number of lesser streams, which no single state has jurisdiction over. Mr. Solomon contends that, sooner or later, the method outlined above will prove to be the only permanent solution of difficulties, which are being fought fruitlessly with all sorts of jetties, piers, mattresses and dredge boats, at fearful expense to the government, only to be swept away with each recurring flood.

"The plan is a vast one," said Mr. Solomon, "but would be vast, too, in its good effects. It involves no complications, however, and if such a law is once passed by congress it will work itself out rationally, easily, and, in the long run, economically to the people of this valley and the entire west."

The Newport News Ship Building & Dry Dock Co. is making extensive additions to its plant at Newport News, Va. One of the large additions under way is the erection of an extension to their machine shop, which will be 100 feet wide and 200 feet long. This building will be used for the finishing and erecting of marine engines and other large machinery used in connection with the several war ships and merchant vessels which this company has under way. The central portion of the building will be 50 feet high, and it will be supplied with an electric traveling crane capable of lifting and carrying a load of 50 tons. On either side of this central space will be located a gallery arranged for small machines and fitting tools. The building is to have steel framework throughout, and the roof is to be covered with corrugated iron. The Berlin Iron Bridge Co. of East Berlin, Conn., will furnish and erect the steel work.

In connection with the visit of Capt. W. S. Schley, chairman of the United States light-house board to Duluth, it is announced that the power of several important lights on Lakes Superior and Huron will certainly be increased. It is also proposed to change the fixed red light at Pipe island to a flash light. The light on Frying Pan island is also a red fixed light and the plan of changing one of them to a flash light is to make impossible the confusion of the two lights for navigators. The Pipe island fixed light will be changed to a flash light of No. 3 order. The Duluth range lights will be changed to the third order, which will greatly increase their brilliancy.

Mr. F. Gourdeau, deputy minister of marine and fisheries, Ottawa, has advertised for tenders for the removal of the wreck of the steamer Cottrell, now lying sunk in Canadian waters, near Bar point light-house, mouth of Detroit river.

The Review has excellent photographs of lake ships.

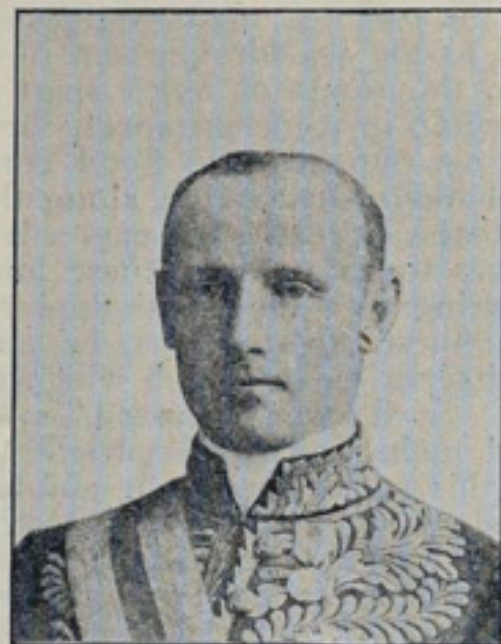
BRITISH SHIP YARDS.

OPINIONS FROM AMERICANS REGARDING THEIR EQUIPMENT AS COMPARED WITH THOSE OF THE UNITED STATES—INTERVIEWS WITH DELEGATES TO THE CONGRESS OF NAVAL ARCHITECTS AND MARINE ENGINEERS—THE VISIT TO CLYDE YARDS.

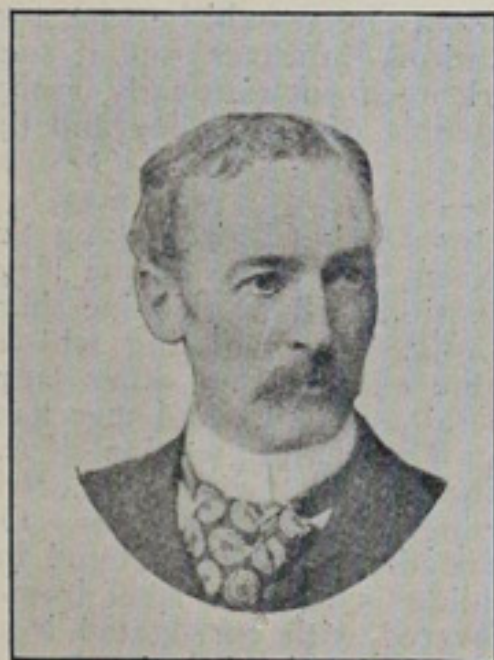
London, July 19.—In a previous letter, dealing with visits to ship-yards in England and Scotland, made by delegates to the International Congress of Naval Architects and Marine Engineers, I ventured the opinion that there was nothing in the practice of ship builders here to give them any advantage over the builders of America. Their labor cost is lower, but the few large plants which we have in the United States are more modern in every way than most of the yards here, and labor-saving machinery is used more extensively in our country. I find that this opinion is general among the American delegates who are now returning from the congress, and it will probably be interesting, therefore, to refer to interviews on the subject which I had with a few of them while visiting the different yards. No account has been given of the excursion to the Clyde, but this will be found further on. Mr. W. I. Babcock of Chicago, who was one of the American delegates, has made his trip to Europe a business trip. He visited several of the ship-yards other than those on the programme of the naval architects, and when I asked him for an opinion as to what he had seen he answered that, notwithstanding the difference in labor cost, he was quite certain that if American builders had only a small share of the great number of orders for new ships that are booked here each year they would soon stand ready to compete with the world in this industry. But for a great number of years the ship owners of all nations have been coming here for new vessels, and time will be required to divert any part of the business to the United States, even under the most favorable circumstances. A talk with Past-Assistant Engineer W. M. McFarland of the United States navy brought out practically the same opinion, but he first referred to the great hospitality of the British society.

"I cannot speak too kindly," Mr. McFarland said, "of the splendid reception we have had and of the great success of the congress in every way. You know, of course, that at a gathering in such an interesting city as London it is rather difficult to arouse great interest in the discussion of papers, but in some respects this congress was an exception even in that regard. One of the greatest pleasures to me in attending the congress has been to meet and listen to the leaders of the profession, whose names have been very familiar to me for years, but most of whom I had never met before. Sir Edward Reed, Sir Nathaniel Barnaby, Sir William White, Sir John Durston, Messrs. Thornycroft, Yarrow, Milton, Seaton, Manuel, Mudd, Sidney Barnaby and others all took part in the discussion, as you know, and I must say that as a rule they were excellent speakers. I told Mr. Seaton that we rather prided ourselves in America on our readiness in debate, but that he would hold a high rank anywhere. I had the chance to see a good deal of him, and he is not only one of the leading engineers of England but one of the best fellows I have ever met. To speak in detail of all the social courtesies we have received would be impossible, but Dr. Elgar, Prof. Biles, Mr. Yarrow, Mr. Morcom and Mr. Sidney Barnaby did a great deal for us besides the entertainments to which all were invited. And I must not forget my good friend Archie Denny. You know what his firm has done in a scientific way, and, since the lamented death of his talented brother, Archie has looked after that side. He is one of the best fellows in the world, and all the visitors owe a great deal to his kindness and attention. The management of such an affair as this congress, with its elaborate programme of entertainments, requires executive ability of a high order, and this work always falls on the secretary. The Institution of Naval Architects can congratulate itself on possessing such an accomplished secretary as Mr. Geo. Holmes. He was

simply perfect and indefatigable, and he has just cause to feel proud of the perfect success of his plans. The visitors owe a great deal also to the Earl of Hopetoun, the president of the institution. You know we citizens of a democratic republic are apt to think of noblemen as being a very effete crowd, and doubtless this is true of some, but Lord Hopetoun is a worker and a model presiding officer. He was assiduous in his efforts to make everything go well, and the success of the congress is due to him in a great degree. I have been so much pleased with the way all our British cousins have treated us that I hardly like to say any more for fear you will think I am exaggerating, and I can only say that when our Society of Naval Architects and Marine Engineers entertains them, as it is sure to do some day, it will have a very difficult task to equal the splendid entertainment that we have enjoyed. One excellent effect of the congress is the creation of friendship among eminent professional men of so many nations which makes them more than ever willing to exchange ideas and thereby advance the profession in all coun-



LORD HOPETOUN.



MR. GEO. HOLMES, SEC'Y.

tries. The attendance at the congress has been something unheard of in an international gathering of this kind; and, as I said in starting, the whole affair has been a great success, and I count myself especially fortunate in having been detailed by the navy department as one of its representatives."

SHIP BUILDING IN ENGLAND AND AMERICA.

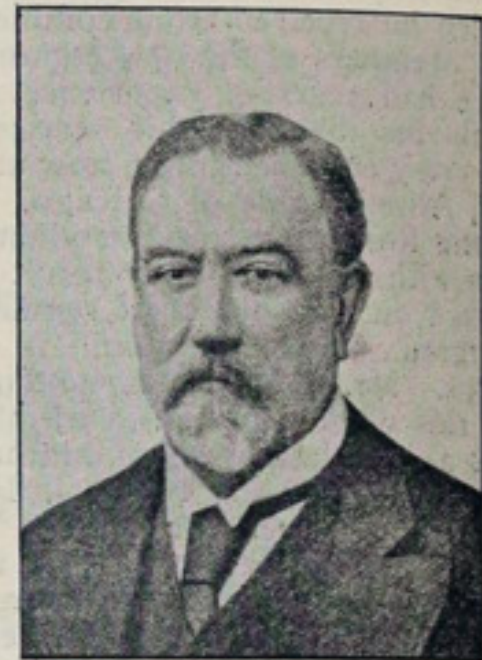
In answer to a question as to what was the opinion of himself and other experts regarding the equipment of plants in Britain and at home, Mr. McFarland replied: "Well, we have seen a good deal to admire, but on the whole we think our later shops are better equipped, and our older ones as well. Of course, everybody realizes that expensive tools cannot be thrown out after a few years' service just because better ones have been devised, and naturally the new plants have the better tools. All the yards we visited have been in business many years, so that their equipment lacks many of the modern tools found in such a place as Newport News. One of our ship builders remarked on the entire absence of traveling cranes over the building slips, a feature possessed by all our newer yards. We were all greatly pleased by the readiness of the managers to show us everything, and there was a total absence of the foolish idea that there are great trade secrets to be guarded. Indeed, Dr. Elgar spoke of this, as you remember, and said that if anybody had missed anything to let them know it, so that it could be shown. One cannot fail to be impressed by the marvelous activity in ship building and engineering on the Clyde, and especially by its prosecution under what would seem to be disadvantages. You know that the Clyde is a very narrow and really artificial stream, and yet the greatest steamers in the world have been built in these yards. We heard a good story of a conversation between an American and a Scotchman on the subject of the Clyde. The American was speaking of it very disparagingly in comparison with our rivers, such as the Hudson and Delaware. 'Yes,' said the Scotchman, 'but God made the Hudson, while we made the Clyde ourselves.' This is almost literally true. Sixty years ago it was a little creek, only three feet deep. Now it has been dredged and blasted out until it is 28 feet deep.

"I must tell you, too, of a most interesting trip made by Mr. W. I. Babcock and myself to the works of Messrs. G. & J. Weir at Cathcart. Mr. James Weir and his sons, Messrs. J. R. Richmond and William Weir, were very kind during our whole stay at Glasgow, and they made our visit to the works specially pleasant, taking us everywhere. Probably they are best known at home as the makers of evaporators and hydrokineters, but a large part of their business, and the most important, is as makers of feed pumps, of which they have supplied a great many to the British and foreign governments. To say that their place is run on the American plan should be counted a compliment coming from an American, and we were certainly delighted with the plan and equipment of the plant, and above all with the methods of work. All similar parts are made interchangeable, and where possible all work is done to gauge and to surface plates, special sizes of these being used so as to get in all sorts of places. It was a visit to make anyone with a mechanic's instincts very much pleased. Denny's shipyard and engine works have both been held up as models so long that everybody knows about them. Of course, we were all very much pleased with our kind reception by the firm and with all we saw. It was a matter of general regret, in view of the great size of Armstrong's plant at Newcastle, comprising ship-yard and ordnance works, that our visit was necessarily very hasty. Probably every one was most impressed by the great hydraulic forging presses, although the big gun plant was very impressive too. While viewing the large number of ships for foreign governments on hand here, I heard the remark from Americans that it behooved us not to fall behind in our ship building programme, or Japan would soon have a more powerful navy than ourselves. I am not sure whether these are the largest works in the world, but they must come near the top with their list of 24,000 employees."

TWO FAMOUS CLYDE SHIPYARDS.

MR. G. W. MANUEL,
OF P. & O. CO.

The programme attending the visit of the naval architects to the Clyde, which was referred to only briefly in previous letters, was in every respect equal to the unlimited hospitality of England. In this cradle of the art of marine engineering and naval architecture the visitors had expected to divide their time between several ship-yards. They spent one day in two of them—fortunately the most important on the Clyde—when they were again called upon to accept urgent invitations to entertainments of various kinds, among them a reception by the Lord Provost and the corporation of the city of Glasgow and a pleasure excursion on the Clyde. The cruise was around Arran and Ailsa Craig, going via the Kyles of Bute and the Sound of Kilbrennan and returning by way of the south end of Arran and Fairlie roads. More beautiful scenery in a day's sailing could probably not be found in any part of the world. On the first short run down the Clyde to the works of the Fairfield Ship Building & Engineering Co. at Gogan, and to those of Messrs. Wm. Denny & Bros. and Messrs. Denny & Co., Dumbarton, the visitors got only a passing view of the Clydebank company's yard and several other



SIR EDWARD REED.

concerns. They were thoroughly convinced, however, that they had come to the ship building center of the world, for upon arrival at the Fairfield yard they found work on hand to the extent of 56,320 tons in new hulls and 116,500 horse power in machinery. This included three cruisers and three torpedo boat destroyers for the British government, as well as four big merchant steamers and a twin-screw yacht for Baron Edmond de Rothschild. As an engineering company the Fairfield firm is among the oldest on the Clyde (established in 1834), but the first ships turned out here were four blockade runners built for the Confederacy during the late war in the United States. The extent and importance of work on hand at the present time is evidence of the vast proportions of this establishment. Still it cannot be said that this great ship-yard, nor, in fact, any of those that have been visited in this country, present any special advantages over those of our own country, as regards either workmanship or the methods pursued. No feeling of home pride enters into this statement. These works are immense and years of development have made them wonderful, but they have no tools that are not equalled in the few new yards that we have in the United States, and in labor-saving machinery, especially for the handling of material on and around the vessels under construction, they are really at a disadvantage. A keel-bending press (hydraulic) in the plater's shed at the Fairfield yard attracted considerable attention, as it is capable of bending, full square, plates of 1½ inches thickness. Belleville water-tube boilers, under construction here for the H. M. S. Diadem, were also examined with special interest by the visitors, who spent about three hours going over forty or more acres of ground covered by machine shops, boiler shops, foundries, pattern shops, admiralty store and gunnery shops, saw mills, offices, etc. At a dinner served in an immense mould loft there was the usual display of liberality, and toasts of a kind that caused the company of about 400 to carry away pleasant recollections of everybody connected with the works.

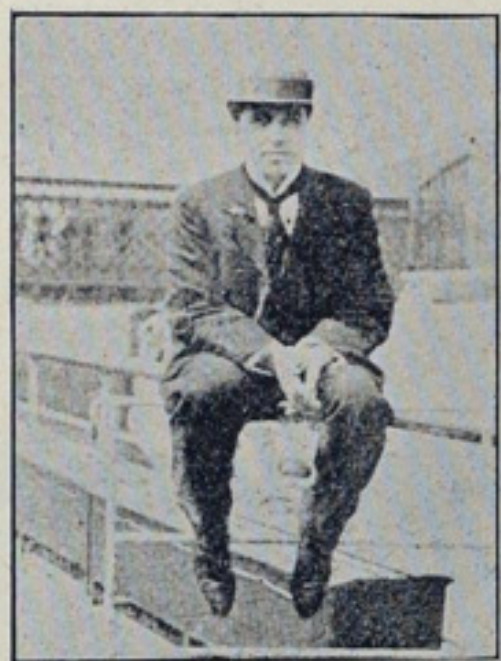
Rounding the historic Castle Rock of Dumbarton, at the base of which Robert the Bruce is said to have built, in olden times, vessels for his own delectation, the visitors were soon within the works of Messrs. Denny, famous as the great scientific yard of the world. This plant has been so often described that it is unnecessary to refer to it again in detail. All vessels under way here were for the mercantile marine, as this yard does not engage in naval work. The vessels on hand included three large steamers, each of some 8,000 tons deadweight capacity, for the British-India Steam Navigation Co., mainly for cargo carrying; a medium-sized twin-screw steamer for the Union Steamship Co. of New Zealand, and a finely-modeled twin-screw steamer of some 300 feet length for the London & North-Western Railway Co.'s channel service between Holyhead and Greenore. This latter vessel is to maintain a speed of 21½ knots in actual service. The joggling system was being used in the application of plates to the big cargo carriers, and in this there was considerable interest. It is the general opinion here, as in England, that all of the builders will soon be using joggled plates on freight vessels. All of the visitors witnessed trials of models in the experimental tank at this yard, and the Denny brothers, who are known to naval architects all over the world, were accorded many compliments on account of the part taken by their family in the advancement of the science of ship-building. In the toasts that followed another luncheon here, Mr. Peter Denny responded in English, Mr. Archibald Denny in French and Mr. Leslie Denny in German. Mr. John Ward, another member of the firm, also assured the visitors of an earnest desire to have them see all departments of the works and to return the courtesies of previous years in Germany and France, although he was on such occasions usually surrounded by ship-yard cares, and had not found an opportunity to attend gatherings of this kind.

THE GREAT WORKS AT NEWCASTLE.

The visit to the world-famous works of Sir W. G. Armstrong, Whitworth & Co. at Newcastle-on-Tyne was made on the return trip to London. Amongst the objects of interest in the ship-yard at these works were two armor-clad battleships of 14,800 and 12,200 tons respectively; two first-class armored cruisers, of 9,600 tons each, and a speed of twenty knots; two fast protected cruisers of 4,500 tons each, and a speed of twenty-four knots; two fast protected cruisers of 4,300 tons each, with a speed of twenty-three knots; one fast protected cruiser of 4,250 tons, and a speed of twenty-one knots; two armor-clads of 3,800 tons, and a speed of seventeen knots; three fast protected cruisers of 3,450 tons each and a speed of twenty knots; one third-class cruiser of 2,800 tons and a speed of eighteen knots; one training ship of 2,500 tons and a speed of fourteen knots; and one torpedo-boat destroyer of 300 tons with a speed of thirty knots—all in process of construction. In the ordnance department all kinds of works upon the famous guns were witnessed. The firm have now in hand 900 guns.

Before leaving London the American delegates to the congress gave expression to their appreciation of the kindness shown them by presenting the following memento, neatly inscribed, to the secretary of the Institution of Naval Architects:

"The American delegates to the International Congress of Naval Architects and Marine Engineers, profoundly touched by the kindness and hospitality extended to them by the officers and members of the Institution of Naval Architects, desire to place on record their appreciation of the many courtesies they have received and of the truly magnificent series of entertainments of which they have been guests. They count themselves especially fortunate in coming to the mother country in the year of the diamond jubilee of Her Gracious Majesty Queen Victoria, when so much has occurred to make all Anglo-Saxons proud of their



MR. DANZIE, ASST. SEC'Y.

race. They desire especially to thank the Rt. Hon. the Earl of Hopetoun, president, and Mr. Geo. Holmes, secretary, for their continued and repeated kind attentions, and to congratulate them and the institution on the successful management of the greatest gathering of scientific men of which they know. And they beg all their kind friends of the institution to be assured that they will carry away with them the warmest feeling of affection and gratitude toward them."

J. M. M.

Neglect of Important Rules.

In a letter printed in the last issue of the Review, the attention of officers of the Lake Carriers' Association was directed to a statement made by Capt. Gibson, who was last season in the steamer Brazil, about vessel masters who ignore the rules governing the passage of vessels in narrow channels. It was suggested that in some parts of the Detroit river a patrol service is needed about as badly as it is in the Sault river, but in answer to this Capt. McKay of the Lake Carriers' Association sent to Geo. L. McCurdy of Chicago, who brought the matter up, a copy of sections of the pilot rules for the lakes that define very clearly the duties of vessel captains in navigating narrow channels. These rules were adopted by the government at the suggestion of the Lake Carriers' Association, and upon complaint from any vessel captain or vessel owner the penalties connected with them would undoubtedly be enforced. But there is always some hesitancy in bringing about the enforcement of rules in this way, and it would seem that the best that can be done is to direct the attention of everybody concerned to the existence of the rules and the important bearing they would have on an action at law in event of accident. In a letter to Capt. McKay dealing with this feature of the question, Mr. McCurdy says:

"I note that where any captain will make a complaint of another captain acting in the manner to which the captain of the Brazil refers, he would certainly find the steamboat inspectors ready to take up such a case. This no doubt would be the legal way to proceed, but you know how captains hesitate to carry tales. To get down to the square charge of one master against another that he did wrong would be rather an arbitrary way to handle the matter just at the present time, when there seems to be such a feeling on the part of the masters to co-operate each with the other. These matters perhaps could be better handled by the masters understanding fully what their obligations are. I think the lake captains are as fair-minded a body of men and as watchful of each other's interests as any set of men anywhere, and that all they need is to have the matter brought to their attention to have them appreciate the importance of the subject. Perhaps the publication of letters of this kind bearing on the subject may be all that is necessary. We all, underwriters and owners, want to minimize the chances of loss. The owner is not fully protected by his insurance in case of loss. He loses the time of his ship while repairing. The Lake Carriers' Association having adopted the rules as presented in the document that you have sent to me, and requested that they be posted in the pilot-house, I think it would be an excellent idea for the owners to have their attention called to the complaint of such masters as Capt. Gibson, with the suggestion that they caution their masters against negligence of the rules. This would be better than a system of espionage or complaint of one master against another, and I am quite sure the captains are remiss simply because they do not understand the full force of these rules, and when their attention is called to them we will have less of this thing happening in the future. Right along in the same line is the statement made by Capt. Morris of the steamer M. P. Grover. This letter appeared in the Marine Review of July 29. Capt. Morris tells of a disregard for rules governing fog signals and passing signals that is similar to the complaint made by Capt. Gibson. Both appear to have been doing everything that they should do according to law, and the passing boats were clearly at fault, so that these masters have just cause for complaint."

A Modern Warship's Auxiliary Machinery.

In a warship, like the Massachusetts, of the United States navy, there are altogether eighty-six steam engines, big and little, in the equipment, and many of these engines have double steam cylinders; in fact, there are no less than 158 steam cylinders, all told. With so many engines to be supplied with steam, it is very apparent that the matter of economy should be carefully studied. This subject has been looked into more or less, but it has been found that to compound the engines of many of the auxiliaries would add still more to the complication, to say nothing about additional weight and space. Then, again, many of the auxiliaries are only occasionally brought into use. However, there is no doubt that as great a stride will be made in the near future in steam economy for the auxiliary engines as has been done with the main engines.

Although the power of all the auxiliaries on the trial trip of the Massachusetts averaged only about 2¾ per cent. of the indicated horse power of the main engine, the actual amount of steam used by these auxiliaries was, no doubt, anywhere from 10 to 15 per cent. of all the steam generated. On the trial trip referred to the main engines and the auxiliaries in use developed the following powers: Main engines, 10,128 I. H. P.; air pumps, 12½, or about one-eighth of 1 per cent. of the power of the main engines; circulating pumps, 36½, or about one-third of 1 per cent.; feed pumps, 64, or about two-thirds of 1 per cent.; forced draft blowers, 107, or about 1 per cent.; other auxiliaries, 45, or about one-half of 1 per cent. The total of all the auxiliaries was 275 I. H. P., or, as above stated, about 2¾ per cent. of the I. H. P. of the main engines. This certainly shows that there is an opportunity for the designers of the different auxiliaries to try and see if some of this steam cannot be saved.—F. Meriam Wheeler, in Cassier's Magazine.

The Marine Review has prepared in neat oak frames cards containing the schedule of time required to be run between certain points in the St. Mary's river under the speed limit of seven miles an hour. When hung in a pilot house, distance and time may be readily noted from these cards, as the type is large. They will be sent by express to any address at \$1 each, or may be had upon application at 409 Perry-Payne building, Cleveland, for 65 cents each.

Buffalo's New Steel Elevators.

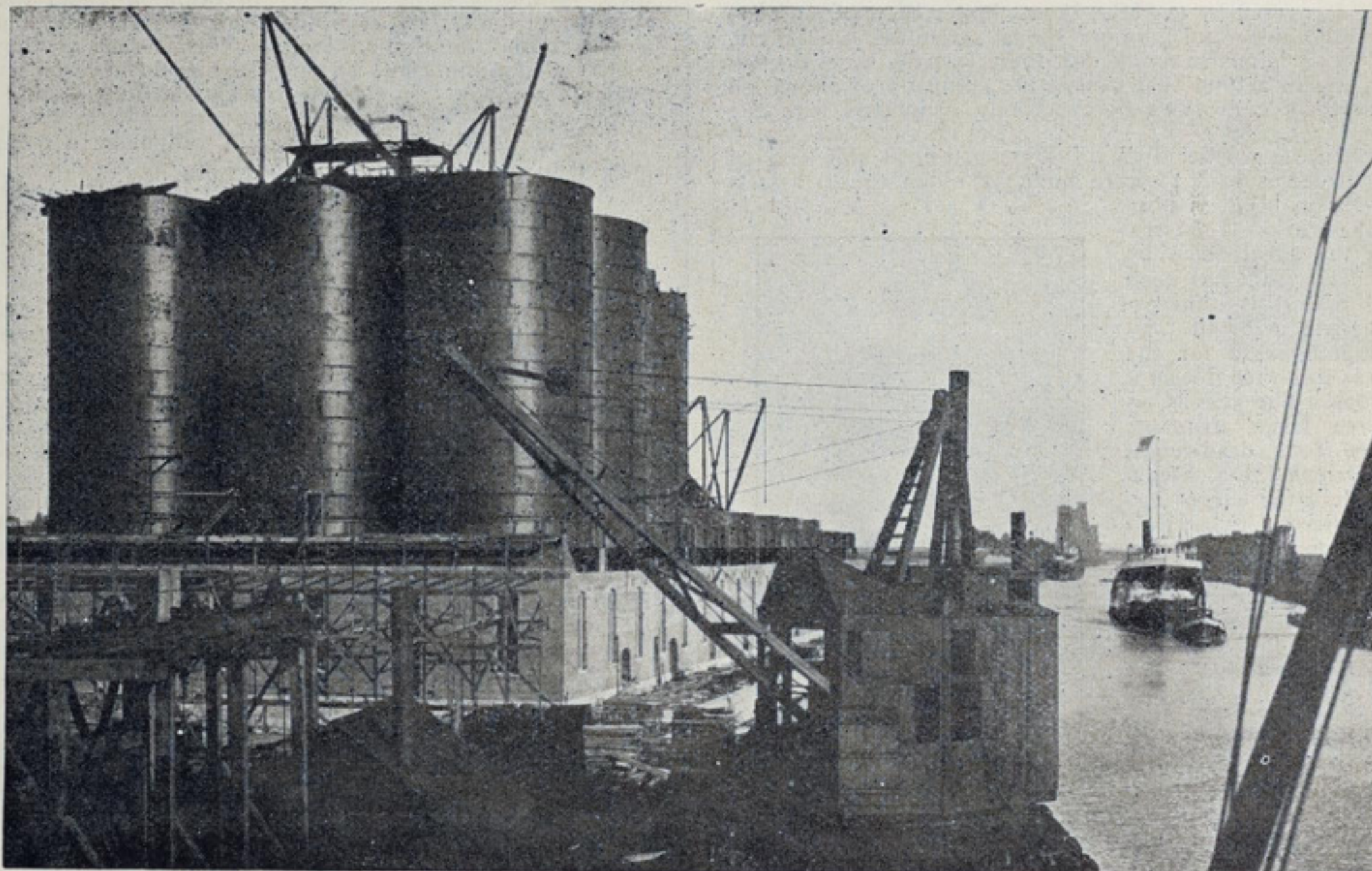
Although it was expected some time ago that the big steel elevator under construction at Buffalo, which is known as the Northern elevator, and which is to have a capacity of 3,000,000 bushels, would be ready to receive grain this fall, it is now quite certain that the structure will not be completed until next spring. An illustration on this page is from a photograph taken recently and will serve to indicate the method of construction as well as the present condition of the work. The steel bins in the forward part of the picture are up to their full height. At the other end they are just fairly begun. At present the cluster of great steel bins is wholly exposed, but as soon as the steel work is finished they will be enclosed within brick walls, which are now rapidly going up, and the modern character of the building will be hidden. This elevator, located between Ganson street and the ship-canal, about 500 yards south of Michigan street, will be the first steel elevator in the east, and is expected to work a great change in the business of transferring grain at Buffalo, as increased capacity and improved methods will undoubtedly bring about reduced charges. Another small steel elevator, quite similar in design, is being built on Buffalo creek near the Tift farm.

Work on the Northern Elevator was begun five months ago. It was necessary to go down 60 feet for a foundation, and the amount of material buried out of sight there was enormous. On the foundation is built a structure wholly of steel. The bins rest on steel columns that are about

"Things Maritime Never Dry."

Mr. C. E. Kremer, well known among admiralty lawyers of the lakes, is now called the wise wag of the Chicago bar. A recent session of the State Bar Association of Illinois was the most notable ever held by that body, and at a feast given at the Chicago Beach hotel Mr. Kremer was selected to respond to the toast "Things Maritime—Never Dry." A part of what he said is contained in the following paragraph, which was taken from one of the law journals:

"In the presence of, and surrounded by high judicial officers, wise judges, able lawyers, learned men and dignified and serious members of the State Bar Association, and the ladies with a wealth of beauty of face, figure and fashion, I feel like the ass in the picture of the Holy Family, that I'm the only one who hasn't got a halo on. My head shines, but it is not with a halo. That I am bald is the naked truth, but you lawyers ought not to treat my baldness with mirth, for I lost my hair at law. Life is made up of fact, fiction and foolishness. Each plays its part. Each is good in its place, but the three mixed up make an excellent cocktail to stimulate the appetite and desire to live. Being a man of maritime affairs I feel very much at home here, because I see so much water about me. Water is all very well, but it has made a great deal of trouble in the world. You all remember the spell of wet weather that happened long, long ago, when, if it had not been for Noah's ship building and navigation, we would not now be living and enjoying the prosperity



CONSTRUCTING THE NORTHERN ELEVATOR, BLACKWELL SHIP-CANAL, BUFFALO.

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2 feet square. There are three rows of bins, with ten in each row, thirty in all, and each bin has a capacity of 100,000 bushels, a total of 3,000,000. Each bin is 84 feet high and 38 feet in diameter. They are far enough above the floor to admit of discharge from their bowl-shaped bottoms, and between the rows are smaller bins about 15 feet in diameter, into which the grain is first carried from the vessels and subsequently elevated by the old cup method to the top of the large bins. The steel in these bins is about a half an inch in diameter, and comes from the mills punched for riveting. The process of putting the unwieldy plates together is interesting. The plates are first put together in sections, derricks for handling the plates and riveting machines for the joining work being used. These sections are hoisted into place and with additional riveting are made a part of the great tubes.

An excellent chart of Green bay and approaches on a large scale has just been published by the United States hydrographic office and may be had from the Marine Review. The chart is corrected to March 1, 1897, and takes in, with Green bay, the west shore of Lake Michigan from Manistique to Kewaunee. It will be of great value to masters of Lake Michigan trading vessels, as well as the men in charge of the larger ore and coal carriers trading to Escanaba. Soundings are in feet and there is a scale of statute miles attached. The price is \$1.25, but the chart is so complete in detail that it is larger than the single sheet charts of either Lake Superior or Lake Michigan.

Luce's "Seamanship" is a book that is specially suited to assist young officers of the naval reserve. It is being used by naval reserve organizations all over the country. It is a standard work, selling at \$10, and will be mailed to any address at that figure by the Marine Review, 409 Perry-Payne building, Cleveland.

Niagara Falls is the place,
August 16 is the date,
Nickel Plate is the road,
Ask agents for the rate.

that our new administration gave us. Noah, however, after holding a number of inquests, saw so much sorrow drowned in water that he soon retired from sailing and went to making wine, and ever since then a great many people have used wine for the purpose of drowning sorrow. In looking over the early files of the Chicago Tribune (the first came out in Rome), I saw that even in those days a man who had sorrow drank wine, and if he had much sorrow he drank much wine and was cured. Now, the difference between using wine and using water is, that in the one case you have pleasure and lose sorrow; in the other you lose sorrow and come to grief. Therefore, wine is better than water, but if we had no sorrow we would have nothing to get rid of (but our cases) on occasions like this, and those occasions would lose one of their chief charms. Therefore, let us not sorrow that we have sorrow, but let us be glad that we are not sorry that we have sorrow, like the man who said of the Republican: 'I am a good deal happier than he is; I have been a Democrat and got over it, but he has always been a Republican.' But it does not take much to make some people happy, as was said of the man who enjoyed the prosperity that consisted only in a change of administration. During all of my career I have striven to get fees or fame; the first I get and it goes, and the other somebody else goes and it gets, leaving me to laugh or be laughed at. I suppose this will continue until my right of action is cut off by the Lord's statute of limitations. Still I hope to die famous, for there must be a great deal of satisfaction in knowing that you are famous when you are dead, even when you know that you are not famous when you are not dead. This satisfaction I have not from any one who has had experience; I only heard it; but I have practiced in maritime law so long, and have had to believe so many things that were not so, that I am ready to believe almost anything. Besides that, it is no more than fair that I should, because I have to believe so many things that I say myself that I ought to believe some things that other liars say."

Mr. Alex Brown of the Brown Hoisting & Conveying Co., Cleveland, has gone to Germany with a view to concluding negotiations, pending for some time past, for the manufacture of Brown hoisting apparatus at the Krupp works.

Iron Ore Shipping Docks.

With the development of big vessels for the iron ore trade of the lakes, numerous changes have been made in the shipping docks at upper lake ports. These docks have been raised and otherwise changed, and in the case of some of the new docks special account has been taken in their construction of the kind of vessels that would be trading to them. Particulars of the different docks in the following table are corrected to Jan. 1, 1897:

Railway.	Location.	Dock No.	Length of Dock.	Width of Dock.	Height of Dock (Water to Deck)	Number of Pockets.	Storage Capacity, Gross Tons.	Height, Water to Ctr. Hinge Hole.	Length of Spouts.	Angle of Pockets.
Chicago & North-Western	Ashland.....	1	1404'	46' 8"	54' 0"	234	36036	32' 10"	27' 0"	39° 30'
		2	1404	46 0	45 0	234	24156	23 10	27 0	210@42 00 24@45 00
	Escanaba.....	1	1104	37 0	48 6	184	24104	28 10	21 0	39 30
		2	1152	37 0	40 3	192	20928	24 1	21 0	31 26
		3	1356	37 0	52 8	226	30284	31 2	27 0	45 00
Duluth & Iron Range...	Two Harbors	4	1500	37 0	48 6	250	32750	28 10	21 0	37 53
		5	1392	37 0	53 3	232	43152	28 6	21 8	40 00
		1	1056	41 0	45 6	141	18000	26 10	23 0	84@37 30 57@32 40
		2	1056	41 0	46 6	176	23900	27 9	23 0	98@37 30 78@32 40
		3	540	49 0	51 6	90	16000	28 10	23 0	38 40
Duluth, Mesabi & Northern	Duluth.....	4	1008	49 0	51 6	168	30000	28 10	23 0	38 40
		5	1008	49 0	54 0	168	33000	30 0	25 0	38 40
		1	2336	52 0	53 0	384	57600	30 0	27 9	45 00
		2	1152	52 0	57 6	192	34560	32 0	27 9	45 00
		3	1700	40 0	45 0	270	27000	25 0		39 00
Duluth, Superior & Western	Marquette.....	4	1200	53 6	37 0	213	12780	23 0		39 45
		1	1200	36 8	47 3	200	28000	27 9	21 1	39 45
		1	600	49 8	52 0	100	15000	29 9	26 0	43 21
			900	49 8	57 0	150	25500	33 0	27 3	45 00
		1	1200	52 0	54 0	200	36000	30 9	24 7	38 45
Lake Superior & Ishpeming	Gladstone.....	1	768	37 0	47 0	120	15000	26 8	21 8	40 00
		1	1908	36 0	54 6	314	33500	31 4	27 0	234@42 30 80@50 45
Minneapolis, St. Paul & Ste. Marie Wisconsin Central Lines...	Ashland.....									

Heavy Losses on Steel Vessels.

Within the past ten days twelve big steel vessels that have been in collision or have suffered bottom damages from striking in the rivers have been ordered to ship-yards or dry docks in Cleveland and West Superior for repairs, involving an expenditure in each case ranging from \$5,000 to \$15,000. The list in Cleveland includes the barge 133, barge Corliss, steamer Vulcan, barge Holley, and steamers Selwyn Eddy, J. H. Wade and Owen. West Superior has had the Mariposa, Zenith City and barge 115, and now it is understood that the barge 117 has been ordered to that point for bottom repairs. She struck a loose boulder in the Sault river above the canal, and one of her water bottom compartments is full, but it is thought that she can safely go light to the head of the lakes for repairs. In this batch of losses the underwriters represented by Johnson & Higgins will probably suffer most, as insurance on vessels of the Bessemer company's fleet and those managed by Pickands, Mather & Co. was placed through the New York brokers.

Another Victory for the Enquirer.

The steam yacht Enquirer, owned by W. J. Connor of Buffalo, has scored another victory in a race on Lake Michigan and may be said to be the fastest yacht on the lakes. In a race on July 29 that extended from the breakwater outside of Chicago harbor to the south point of Milwaukee bay, a distance of 85 miles, she forced the whaleback passenger steamer Christopher Columbus to a full test of her big engines, to beat her inside the harbor piers by a scant minute, and left the ram prow yacht Pathfinder so far in the rear that that vessel put about and returned to Chicago. The race, which was for a cup, was between the Pathfinder, owned by F. W. Morgan, and the Enquirer, but the yachts were accompanied by the passenger steamers Virginia and Christopher Columbus. The failure of the Pathfinder to finish the race was said to be due to the breaking of a tube in her boiler. Another race between the yachts on Lake Erie in the fall is talked of. The Enquirer is said to have made the run of 85 miles in 4 hours and 18 minutes, while the time of the Christopher Columbus was one minute better.

More Sault River Improvements.

An advertisement elsewhere in this issue calls for bids on dredging and submarine rock excavation in St. Mary's river. The specifications are not at hand and the extent of improvements to be made immediately is not known, but it is quite probable that Col. Lydecker is preparing to expend a large portion of the unexpended balance of \$950,000 which remains from the original appropriation of \$3,350,000 authorized for the 20-foot channel project. It is understood that new operations will involve the excavation of 600,000 yards of rock and earth in the Sault river. The improvements include the widening of the channel through the Round island shoals from 300 feet, the present width, to 800 feet. Through the Middle Neebish the channel will be widened to 500 feet, the present width being 300 feet. The depth will also be increased to 21 feet at the Neebish, it being 18 feet at the present stage of water. These improvements are expected to give a uniform depth of 20 to 21 feet throughout the river.

A special \$3 excursion to Niagara Falls via the Nickel Plate road, Aug. 5. Train leaves Cleveland 10 p. m. For sleeping car berths apply at 189 Superior street, 534 Pearl street and depots. 245, Aug. 5

Around the Lakes.

The Boston Post notes the loss on the Atlantic coast of the schooner Ira Lafrenier, a wooden vessel of 198 tons that was built in Cleveland in 1863.

Vessels taking ore to Tonawanda are loading as deep as 14 feet 6 inches. The steamer Wilhelm made the passage down the river without difficulty while loaded to that draft.

M. J. Weaver, who for the past ten years has been local agent for the Northern Steamship Co., Anchor line and Western Transit Co. at the Sault, has resigned and will be succeeded by S. H. Davis, who was his assistant.

One of the United States revenue vessels, the Calumet, put into Benton Harbor, Mich., a few days ago, and levied fines against fishing tugs, pleasure craft, river steamers, etc., aggregating \$1,300. Violation of government regulations was the cause.

The death is announced from Detroit of Capt. Hugh E. McGraw, one of the oldest masters on the lakes, once in command of the Ira H. Owen—now the Monohansett—and the tug Justice Field, and assistant to Capt. Eber Ward in his vessel business.

Congressman Mahany of Buffalo has consulted officers of the revenue cutter service and is quite confident that he will succeed in inducing them to station at Buffalo one of the new revenue cutters for the lakes, which are under construction at the works of the Globe company, Cleveland.

Capt. John Irvine, who sailed the steamer Minnedosa early this season, died at his home in Kingston, Ont., on Thursday last. He was one of the captains of the Kingston Transportation Co., and at one time was master of the Scotia. He had followed the lakes since he was twelve years old.

Gen. Manager Gildersleeve of the Richelieu & Ontario Navigation Co., says that the two new St. Lawrence river steamers, for which Mr. Frank E. Kirby of Detroit is furnishing designs to his company, will cost together about \$400,000. It is said from Kingston that the vessels will be built there under Mr. Kirby's supervision.

A part of the testimony in the Waldo-Choctaw collision case, which involves a loss of about \$25,000, has been taken at Sault Ste. Marie during the past week. The case will probably be tried in Cleveland in the fall. Harvey D. Goulder represents the Choctaw, and the Waldo is represented by John Shaw of Detroit and Geo. Clinton of Buffalo.

A dispatch from Duluth says that the Duluth, Mesabi & Northern road has leased of the Wisconsin Central 400 ore cars and an additional engine. The Mesabi road owns 1,800 ore cars and will, for the balance of the season, operate 2,200 cars. It is said to be the intention of the company from now on to deliver 900 cars of ore at its docks in Duluth every day.

A note from the Cleveland branch hydrographic office says that the Dominion cruiser Petrel recently made a thorough examination of the location of the wreck of the schooner Adams in Lake Erie, which was reported blown up and removed, leaving 25 feet of water. The Petrel found as little as 14 feet of water, and left a small white flag buoy about the center of the wreck.

About Aug. 16, a light of the sixth order will be established in the new structure on the westerly end of Squaw point, east side of Little Bay de Noquette, northerly end of Green bay. The light will show fixed white with a fixed red sector, and will be visible about thirteen miles in clear weather. Bearings and distances of prominent objects are: Escanaba light-house, S. by W. ½ W., 6¾ miles; Saunders point, N. by E. ¼ E., 1½ miles.

Capt. Robinson of the Union line steamer Ramapo, who will sail the new steamer Starucca of the same line, which is about completed at the works of the Union Dry Dock Co., Buffalo, has turned over the command of the Ramapo to Capt. McDonald who was in the Rochester. Some changes have also been made in vessels of the Western line of Buffalo. Capt. Jones of the Mohawk has retired. Capt. Robert Murray of the Arabia has been appointed commander of the Mohawk, and John Davis, who was mate of the Mohawk, has been appointed captain of the Arabia.

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store in regular elevators at the principal points of accumulation on the lakes, July 31, 1897:

	Wheat, bushels.	Corn, bushels.
Chicago	3,778,000	6,615,000
Duluth	1,197,000	23,000
Milwaukee	110,000	3,000
Detroit	53,000	15,000
Toledo	698,000	359,000
Buffalo	788,000	470,000
	6,622,000	7,485,000

As compared with a week ago, the above figures show, at the several points named, an increase of 1,114,000 bushels of wheat and a decrease of 50,000 bushels of corn.

A letter from the Joseph Dixon Crucible Co. of Jersey City, N. J., says: "Much has been said and written lately concerning protective coverings for iron structural work. The growing tendency among those who have given the matter careful consideration is to add some form of carbon to the red lead used, or to discard red lead altogether. This has caused the red lead manufacturers to issue pamphlets condemning the use of carbon—especially graphite. The statements of the red lead people have been so wide of the facts that we have made reply by issuing a pamphlet on the subject, which may be had upon application by anyone interested."

Lists of names of captains and engineers of lake ships, appointments of 1897, may be had from the Marine Review for \$1. Vest pocket size.



DEVOTED TO LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 409 Perry-Payne building, Cleveland, Ohio,
by John M. Mulrooney and F. M. Barton.

SUBSCRIPTION—\$2.00 per year in advance. Single copies 10 cents each. Convenient
binders sent, post paid, \$1.00. Advertising rates on application.

Entered at Cleveland Post Office as Second class Mail Matter.

The books of the United States treasury department on June 30, 1896, contained the names of 3,333 vessels, of 1,324,067.58 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons, and over that amount, on the lakes on June 30, 1896, was 383 and their aggregate gross tonnage 711,034.28; the number of vessels of this class owned in all other parts of the country on the same date was 315 and their tonnage 685,204.55, so that more than half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1896, was as follows:

	Number.	Gross Tonnage.
Steam vessels.....	1,792	924,630.51
Sailing vessels and barges.....	1,125	354,327.60
Canal boats.....	416	45,109.47
Total.....	3,333	1,324,067.58

The gross registered tonnage of the vessels built on the lakes during the past six years, according to the reports of the United States commissioner of navigation, is as follows:

Year ending June 30, 1891.....	204	111,856.45
" " " 1892.....	169	45,968.98
" " " 1893.....	175	99,271.24
" " " 1894.....	106	41,984.61
" " " 1895.....	93	36,352.70
" " " 1896.....	117	108,782.38
Total.....	861	444,216.36

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC. (From Official Reports of Canal Officers.)

	St. Mary's Falls Canals.			Suez Canal.		
	1896*	1895*	1894	1896	1895	1894
Number of vessel passages.....	18,615	17,956	14,491	3,409	3,434	3,352
Tonnage, net registered.....	17,219,418	16,806,781	13,110,366	8,560,284	8,448,383	8,039,175
Days of navigation.....	232	231	234	365	365	365

*1895 and 1896 figures include traffic of Canadian canal at Sault Ste. Marie.

A few years ago officers of the Lake Carriers' Association found great difficulty in even getting a hearing from the heads of the light-house service when they sought appropriations for aids to navigation, which in many cases they were maintaining by private subscription. But, as has been the case in other departments of the government, these officers have gradually acquainted themselves with the vast interests of the lakes, and the situation is different now. A few weeks ago the naval secretary of the light-house board, Commander Wilde, made a trip up the lakes and returned more thoroughly convinced than ever of the full justice of appropriations that have been granted of late for the purpose of adequately lighting and buoying and in other ways distinguishing the danger points in various parts of these waterways. Now the chairman of the board, Commander Schley, is on a trip of inspection, going all the way to the head of Lake Superior, and the officers of the Lake Carriers' Association have made arrangements at a few points that will tend to interest him in the subject of lake light-houses. Through the efforts of Capt. Geo. P. McKay and Mr. C. H. Keep, representing the vessels owners, arrangements were made for a special car to conduct Capt. Schley from Two Harbors to the iron mines of Minnesota, and for his return by one of the passenger steamers of the Northern line to Buffalo. At Duluth he was shown the various points of interest in and around the harbor by Mr. A. B. Wolvin and Capt. Alex. McDougall. Capt. Schley has said that the general run of fog signals on the lakes are inadequate for the service required of them, as in many cases they cannot be gotten ready for service until an hour or more after fog has set in. He will probably be convinced also that the power of many of the lights is also inadequate, and that in this regard, as with the fog signals, the board can render a great service by beginning the substitution of better lights and improved signals as soon as possible. These visits of Washington officials to the lakes are always beneficial to the vessel interests and will, of course, be encouraged. Mr. Burton of Cleveland expected to have a party of members of the river and harbor committee of the house of representatives accompany him on a trip to Lake Superior next week. A few of these gentlemen found other engagements more pressing on account of the late adjournment of congress, but Mr. Burton will make the trip anyhow and hopes to have some company. Congressman Jerry Simpson, who has always been very much interested in lake commerce, on account of several years spent as a sailor on lake lumber carriers, will also make a trip to Lake Superior.

As a result of increased steam pressures, superior metals and improved tools, the weight of marine machinery is only two-thirds what it was sixty years ago. Thus the engines of the first Cunarder, Britannia, of 8½ knots speed, weighed about 110 tons, although the power was only 740. A torpedo boat destroyer today has machinery which develops 4,500 horse power and it weighs only 100 tons. The result of 41½ horse power for every ton of machinery got with 30-knot torpedo craft is about the highest yet attained. It is probable that this machinery might not stand the wear and tear of ocean steaming, but with some sea-going cruisers 20 horse power per ton is got; with our fastest ocean steamers 14 horse power per ton, and with the ordinary tramp steamer 7 horse power. This all means greater capacity for carrying a paying load. Thus

sixty years ago the load carried was only 10 per cent. of the total weight driven by the machinery of a ship; today steamers are built of the same speed whose paying load is nearly 75 per cent. of the total load.

The following favorable notice of the Blue Book of American Shipping is especially appreciated. Hundreds of a similar nature have appeared in trade journals throughout the country, but this one is from a publication at home, the Iron Trade Review, which enjoys the reputation of being thoroughly reliable and which covers a field that is closely related to the shipping interests of the lakes. The Iron Trade Review says: "With its excellent 1896 volume, it was something of a task for the Marine Review to excel itself in the Blue Book of American Shipping for 1897. Yet this has been done. Apart from the statistical information and the marine illustrations that take up large space, the new volume has as special features lists of lake vessels, of the owners of 900 of the largest boats, of 1,000 captains, with addresses, and of 2,000 lake marine engineers, with addresses. A department that broadens the scope of the work contains 150 pages of lists of vessels and engineers in the coast marine, with other valuable data relative to Atlantic coast vessel interests. There are 450 pages in all, and the various departments are separated by staining blue the coast directory, while that of the lakes is red. The work is exceedingly valuable to all connected in any way with marine interests, and will no doubt be largely circulated."

Dr. W. J. Gatling, famous as the inventor of the gun that bears his name, is in Cleveland looking after the work of casting and boring the new 8-inch gun that is being made by the Otis Steel Co., and which is to be bored at the works of the Cleveland City Forge. Dr. Gatling says that if the experiments being made with this gun, to be cast in one piece, prove successful, the cost of making the big coast defense guns, which our government has in contemplation, will be cut in two. This experimental gun will weigh nearly 30 tons and will be about 23 feet long. Congress in 1896 appropriated \$40,000 for experiments in casting big guns in one piece, to be conducted under the direction of Dr. Gatling, who is of late directing his attention with all energy to the development of great arms for sea-coast defense.

Secretary Long has decided that the United States naval vessels shall not be equipped with the electrical system of turning turrets until a better system is found than any experimented with hitherto. The battleships Illinois, Alabama and Wisconsin will be equipped with the hydraulic system of turning turrets. Naval Constructor D. W. Taylor, who has just returned from England, where he represented the navy at the Congress of Naval Architects and Marine Engineers, has reported that the British admiralty is making little use of electricity in connection with turning turrets, preferring the safer and more satisfactory system of hydraulics. The armored cruiser Brooklyn is equipped with electrical controlled turrets, and reports received from that vessel have convinced the authorities that electricity for turret use is not at present in a sufficiently advanced stage.—Army and Navy Journal.

Mr. Geo. Shepard, who was with the Globe Iron Works Co. for some time and who is now known to designers of marine engines on the lakes, is in Cleveland on a visit from California, where he has been engaged with the Union Iron Works. Mr. Shepard says the Pacific coast yard is very well supplied with orders. They have in hand a battleship and torpedo boat for the United States government, a cruiser for Japan, and two merchant steamers, one for the Sandwich island trade and another for Mexican coast trade. They have also about concluded arrangements for the building of a ferry-boat for local service, and have on hand at all times the building of marine boilers and engines, as well as a very large amount of mining machinery.

Superintendent E. S. Wheeler of the St. Mary's Falls canal, who is highly regarded by the engineer officers of the war department, was seriously considered for the place on the new Nicaragua commission. Mr. Wheeler was not an applicant and did not even know his name was being considered. If he had striven for the place he would undoubtedly have obtained it. In the event that government work is inaugurated on the Nicaragua within a reasonable time, Mr. Wheeler will undoubtedly have charge of it, unless he should refuse the assignment. The secretary of war is quoted as saying recently that Mr. Wheeler has the reputation of being the best lock builder in the world.—Exchange.

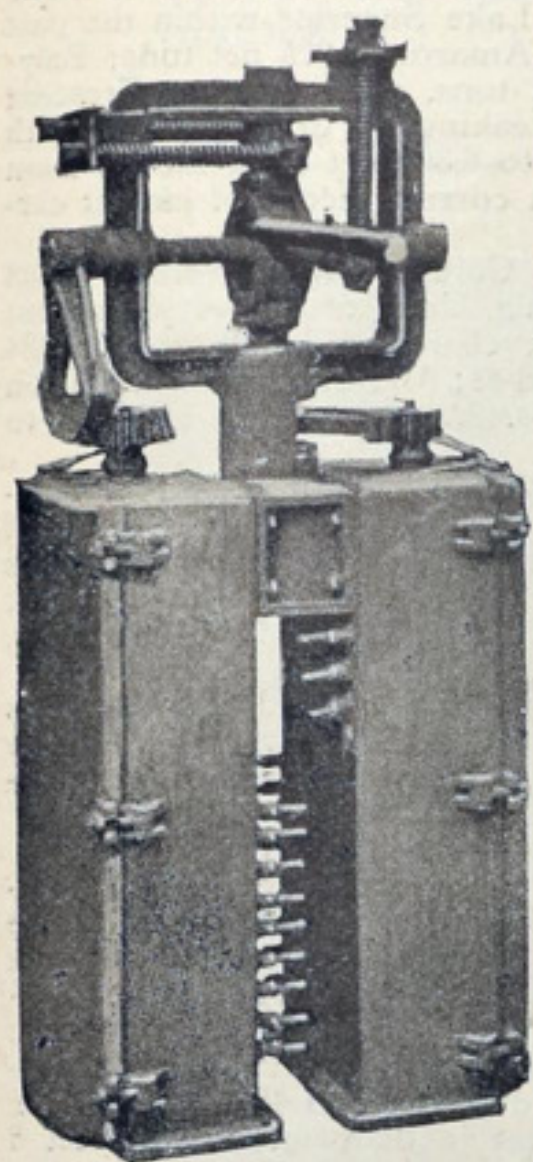
Although the management of the Cleveland Ship Building Co. has not been hurrying the completion of its new plant at Lorain, it is probable that the ship-yard section of the works could be started on short notice if an order for a ship or two were in hand. The main steel building in the ship-yard section is completed, and the necessary furnaces, cranes and other equipment have been under order for some time past, so that they will go in hurriedly when the work of fitting up begins. The big dry dock hole has been pumped out and it is expected that the dock, with pump-house, etc., will be fully completed about the close of navigation.

In about two weeks another steamer will be competing for cargo records with vessels of the Wolvin fleet. Water-tube boilers from the works of the Babcock & Wilcox Co. for the steamer Empire City were received in Cleveland a few days ago and are now being rapidly fitted in the ship. The Empire City was finished in all other parts when the boilers arrived, even to the connecting of piping. The boilers were shipped from New York to Cleveland in a canal boat, by way of the Erie canal and Lake Erie.

The Goodrich Transportation Co. of Chicago seems determined to keep up with appliances tending to the safety of passengers aboard their vessels. They have just given an order to the Standard Automatic Releasing Hook Co. of 22 and 24 State street, New York, for four sets of these hooks for the steamer Virginia. All of the boats on the Virginia are now equipped with the Standard hooks.

Electrical Power Plant Aboard Ship.

The steamship Bremen of the North German Lloyd line, which recently made her first transatlantic trip, is, perhaps, more fully equipped electrically than any other vessel of the merchant marine in the world. Aside from the usual electric lighting plant, she has a very complete and



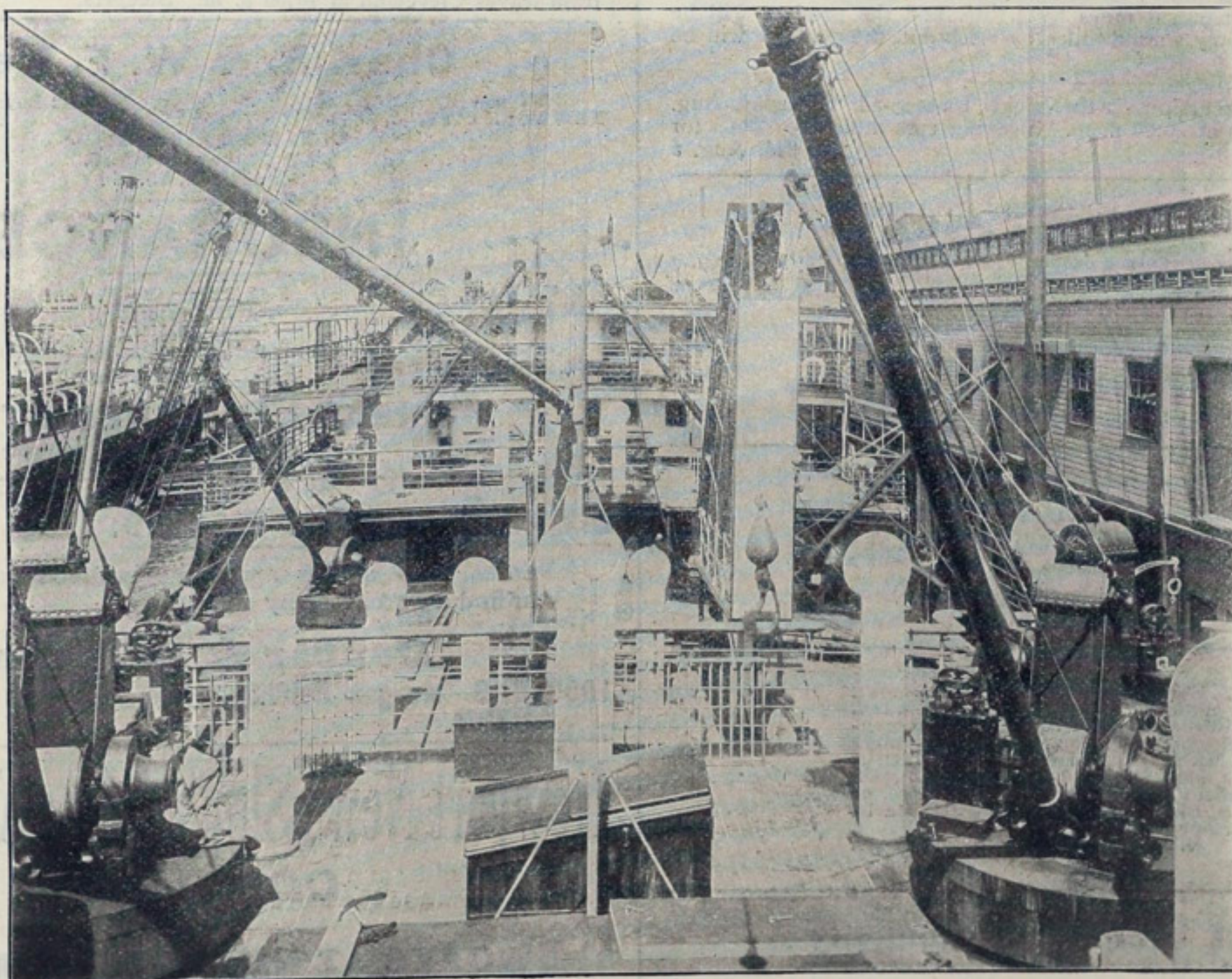
CONTROLLER WITH UNIVERSAL GEAR

most novel power plant, the successful operation of which is now fully conceded. The first power installations on steamers of the North German Lloyd were made by the Union Electricitats Gesellschaft of Berlin, the German ally of the General Electric Co. of Schenectady, N. Y., on the steamships Darmstadt and Prinz Heinrich. In these two cases the familiar and noisy donkey engine were superseded by electrically operated winches, and it was the successful operation of these that determined the North German Lloyd to extend the use of electricity to the Bremen. In this case, however, in lieu of winches, a full equipment of electric cranes was installed. These cranes are sixteen in number, eight on the starboard side of the vessel and eight on the port side. Four of these have a capacity of 3,000 kilograms, or 6,614 pounds, and twelve of 1,500 kilograms, or 3,307 pounds, and they have a total swing outboard of 20½ feet.

The power-generating plant is located in the after portion of the engine-room and consists of four dynamos, each directly connected to its own engine. Two of these are placed on the starboard side and two on the port side. The dynamos have each a capacity of 75 kilowatts, or 100 horse power, and run at a speed of 210 revolutions per minute, delivering current at a pressure of 105 volts. The output of two of the dynamos is used for the cranes; another is used for the lighting of the ship, and the fourth is held in reserve in case of accident or other emergency. The engines are of the triple-expansion type, and were built by Schichau, of Elbing, near Danzig.

of weather, inroads of dust and sea water, and to be of such a nature as to withstand rough handling. In addition, all conductors were to be carefully protected, and the last consideration, but by no means the least, on a passenger-carrying steamer destined to be constantly loading and unloading, the operation of the cranes was to be noiseless. In conforming to these requirements, the Union Electricitats Gesellschaft has produced what is the latest and a very decided innovation in a ship's equipment. The cranes, motor and controlling mechanism are mounted upon a circular iron platform which revolves upon a pivot. This is turned by a motor of 7 horse power, running at 700 revolutions per minute, directly coupled to a worm gear, which in turn meshes in a gearing bolted to the deck. The loads are raised by a 25 horse power series motor, running at a speed of 900 revolutions, and driving a special worm gear meshing into the gear of the drum. On the gear end of the drum shaft is fitted a winch head. The controllers resemble a double street-car controller about two feet high. They are fitted with magnetic blow-out, any spark being immediately extinguished in a magnetic field. The contact cylinders are operated by a special mechanism, actuated by a simple handle or lever, the movements of which correspond to the movements of the load. Raising the handle raises the load, depressing the handle lowers the load, and movement of the crane to the right or left is obtained by corresponding movements at the lever. Raising and swinging movements can be effected simultaneously. So simple are these operations that the dullest stevedore can handle these cranes with ease. Motors and controllers are water-tight and dust-tight, but the cases of both can readily be opened when necessary. To give a more perfect control both motors are provided with band brakes, operated by the foot. These brakes are attached to an extension of the motor shaft. The difference between the large and small cranes lies in the hoisting speed. Practically both cranes are identical in electrical equipment, but the hoisting speed of the 3,000-kilogram crane at full load—60 feet per minute—is only half that of the 1,500-kilogram crane at full load—120 feet per minute. The movement of the jib of the cranes is 13 feet per second.

The most remarkable feature of the cranes, however, is the absolute noiselessness of their operation. During the visit paid by the writer of this article to the vessel, the whole eight starboard cranes, four on the aft and four on the forward deck were engaged in discharging cargo. Had the operation of hoisting and lowering not been witnessed, it would have been difficult to detect the fact, had it been necessary to depend upon the ear. It is this feature that will recommend the electrical crane to ship builders, especially those of passenger and freight steamers, that have occasion to make many stops in taking on and discharging cargo.



AFT DECK OF STEAMER BREMEN, SHOWING EIGHT ELECTRIC CRANES.

The most notable feature of the electrical equipment is the cranes, the lighting installation conforming to the standard practice. In designing the cranes, the principal requirements specified and obtained were as follows: The load should be lifted smoothly; the resistance should be so arranged that the various speeds of the motors should be obtained without too apparent and sudden change; the control of the different motions should be instantaneous and positive, these motions to be effected in the smallest possible space; the cranes to be compact and contain the smallest possible number of parts; the controlling mechanism to be of the simplest to suit the class of operator likely to handle them; and the electrical apparatus to be absolutely protected against changes

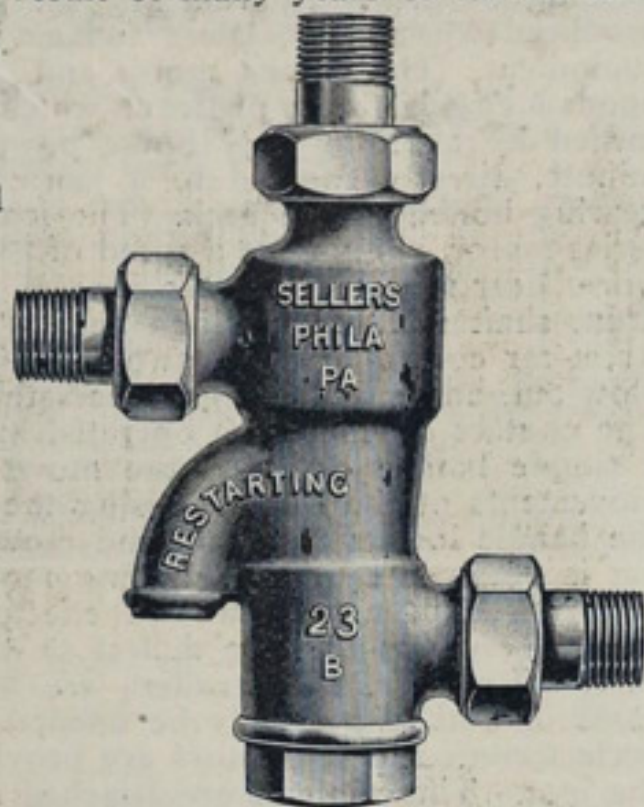
"I thought it might be of interest to you to know," says Capt. J. C. Thompson in a letter to Geo. L. McCurdy of Chicago, "that in coming down the north channel to Round island from Iroquois, July 26, at 9 P. M., the steamer Presley fetched up on a lump possibly 80 feet long with 15½ and 16 feet of water over it and 18 feet around it, about 400 feet N. N. E. from the black and red striped stake at the foot of the middle ground. While there several boats passed 50 to 100 feet from us. The bottom appeared to be all sand."

Several hundred photograph negatives of lake ships are held in stock by the Marine Review. Prints can be made on short order.

Sellers' Restarting Injector.

The Sellers' restarting injector, which is illustrated herewith, was designed and is manufactured by Wm. Sellers & Co. of Philadelphia, whose reputation as makers of high-class injectors is world-wide. Injectors made by this house are the result of many years of careful and scientific experiment, to determine the proportions and shapes that will give the widest possible range, with the most economical consumption of steam, and at the same time be thoroughly reliable. These sizes and proportions are accurately maintained by having the parts made to a perfect system of gauges, so that duplicate parts can always be obtained from the manufacturers which will fit perfectly and give exactly the same results as the original.

Jenkins Bros. of 71 John street, New York, are sole agents for this injector, and in a circular regarding it they say: "It is designed for tug boats, stationary engines, portable, traction and hoisting engines, etc. The branches for steam, water supply and delivery to the boiler are conveniently arranged, so that all the pipes may be placed close against the boiler wall. The overflow is directly under the water branch and can be provided with a drip funnel and discharge pipe, without bending or springing the other pipe connections. The steam nozzle and delivery tubes are screwed into the body, and do not depend upon the pressure of the steam or of the delivery to hold them in place, so that there is no danger of leakage at these important shoulders. The body and tubes are constructed of the best bronze and are designed to give the longest service with the least amount of attention and repair. The injector is simply constructed and contains but few parts. It is perfectly automatic in its action, restarting instantly after a temporary interruption of the steam or water supply. It raises the feed promptly on long lifts, with hot or cold pipes, and gives a good range of capacities."



It is not difficult to remember that the nautical mile is practically 800 feet longer than the statute mile. In other words, one nautical mile is equal to 1.1515 statute miles; or one statute mile is equal to 0.869 nautical miles. Multiply nautical miles by 1.1515, and the product will be statute miles; or multiply statute miles by 0.869 and the product will be nautical miles.

A Niagara Falls excursion via the Nickel Plate road, Thursday, Aug. 5. Special train leaves at 10:00 p. m. Sleeping cars attached. \$3.00 for the round trip. 244, Aug. 5

OFFICE OF LIGHT-HOUSE ENGINEER.
9th and 11th Districts Detroit, Mich., July 24, 1897. Sealed proposals will be received at this office until 3 o'clock P. M. of Monday, the 16th day of August, 1897, for Sturgeon Bay Canal and Devils Island Light Towers, Wisconsin, and North Manitou Light Tower, Michigan. Plans, specifications, forms of proposals and other information may be obtained on application to this office. The right is reserved to reject any or all bids, and to waive any defects. M. B. ADAMS, Major, Corps of Engineers, U. S. A., Light-House Engineer. Aug. 4.

U. S. ENGINEER OFFICE, Duluth, Minn.
July 10, 1897.—Sealed proposals for building two breakwater piers, each some 2700 feet long, at Lake Superior entrance to Portage Lake Ship Canals, Mich., will be received here until noon, Sept. 10, 1897, and then publicly opened. Information furnished on application. CLINTON B. SEARS, Major Engrs. Sept. 3.

U. S. ENGINEER OFFICE, TELEPHONE Building, Detroit, Mich., Aug. 2, 1897.
Sealed Proposals for Dredging and Submarine Rock Excavation, in the St. Marys river, Mich., will be received here until 12 o'clock noon (Standard time) August 31, 1897, and then publicly opened. Apply here, or at U. S. Engineer Office, Sault Ste. Marie, Mich., for specifications. G. J. LYDECKER, Lt. Col., Engrs.

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Cargo Records of Lake Freight Steamers.

The steel schooners Polynesia and Amazon, owned by James Corrigan of Cleveland, are leading all of the big freight carriers in the amount of ore which they are moving each trip. Both of these vessels, as well as the Wilson line steamer Andrew Carnegie, have exceeded their own best records in cargoes moved from Lake Superior within the past week. Their latest loads are as follows: Amazon, 6,275 net tons; Polynesia, 6,134 net tons; Carnegie, 5,935 net tons. The steamer Crescent City has again distinguished herself by breaking all grain records, with a cargo of 225,000 bushels of corn, equal to 6,300 net tons, moved from South Chicago to Buffalo. Following is a correct record of largest cargoes:

Iron Ore—Schooner Amazon, James Corrigan of Cleveland, 5,603 tons gross, 6,275 net, Duluth to Ashtabula, draft of 16 feet 8 inches; schooner Polynesia, James Corrigan of Cleveland, 5,477 tons gross, 6,134 net, Duluth to Fairport, draft of 16 feet 8 inches; Andrew Carnegie, Wilson Transit Co. of Cleveland, 5,299 tons gross, 5,935 net, Two Harbors to Fairport, draft of 16 feet 6 inches.

Grain—Steamer Crescent City, A. B. Wolvin of Duluth, 225,000 bushels of corn, equal to 6,300 net tons, South Chicago to Buffalo, draft of 17 feet; schooner Amazon, James Corrigan of Cleveland, 217,000 bushels of corn, equal to 6,076 net tons, Chicago to Buffalo, 16 feet 6 inches draft; steamer Crescent City, A. B. Wolvin of Duluth, 318,000 bushels of oats, equal to 5,088 net tons, Duluth to Buffalo.

Coal—Schooner Aurania, John Corrigan of Cleveland, 5,187 net tons bituminous, Toledo to Milwaukee; steamer Andrew Carnegie, Wilson Transit Co. of Cleveland, 4,997 net tons of bituminous, Cleveland to Sheboygan, draft of 15 feet 2 inches.

A steel passenger steamer building at Newport News for the Merchants & Miners' Transportation Co. will rank among the best of the smaller class of passenger ships on the Atlantic coast. Her name is Juniata and her dimensions are as follows: Length between perpendiculars, 270 feet; length over all on deck, 293 feet; beam, moulded, 42 feet; depth, 34 feet; sheer, forward, 6 feet 6 inches. Engines are triple expansion with cylinders of 24, 39 and 59 inches diameter and 48 inches stroke. There are four Scotch boilers, each 12 feet in diameter and 12 feet 6 inches long.

Army and navy charts of the lakes are kept in stock by the Marine Review, Perry-Payne building, Cleveland.

\$3.00 to Niagara Falls via the Nickel Plate road, Aug. 5. Special train leaves Cleveland at 10:00 p. m. Sleepers. 243, Aug. 5

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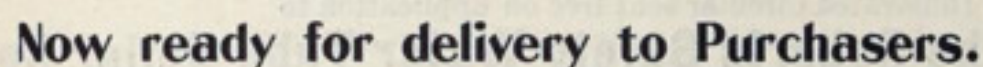
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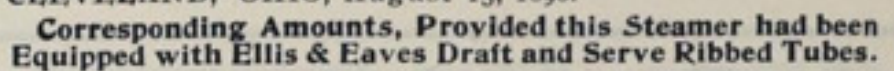
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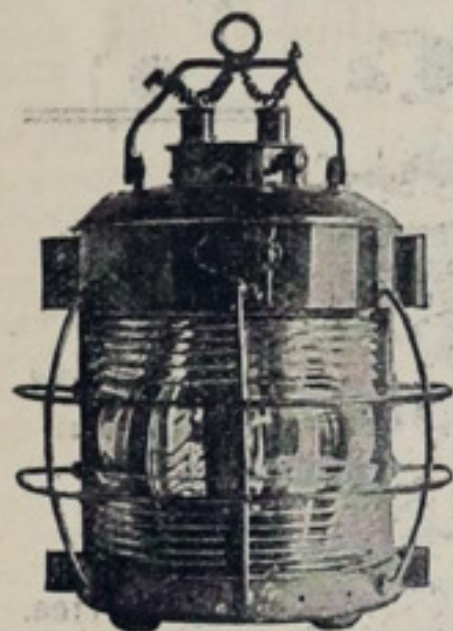
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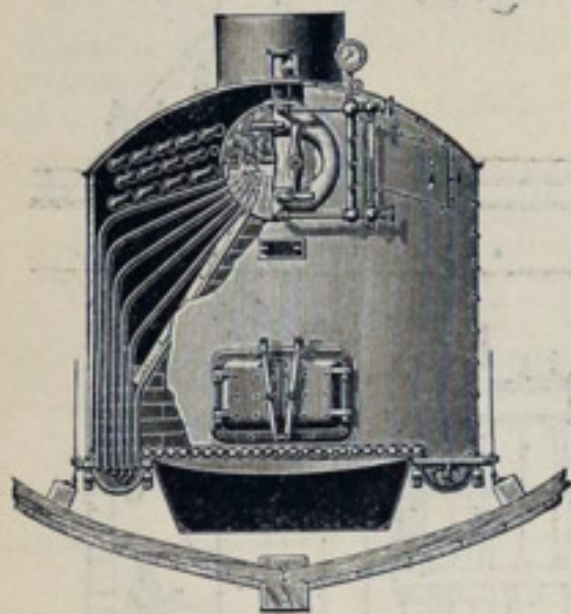
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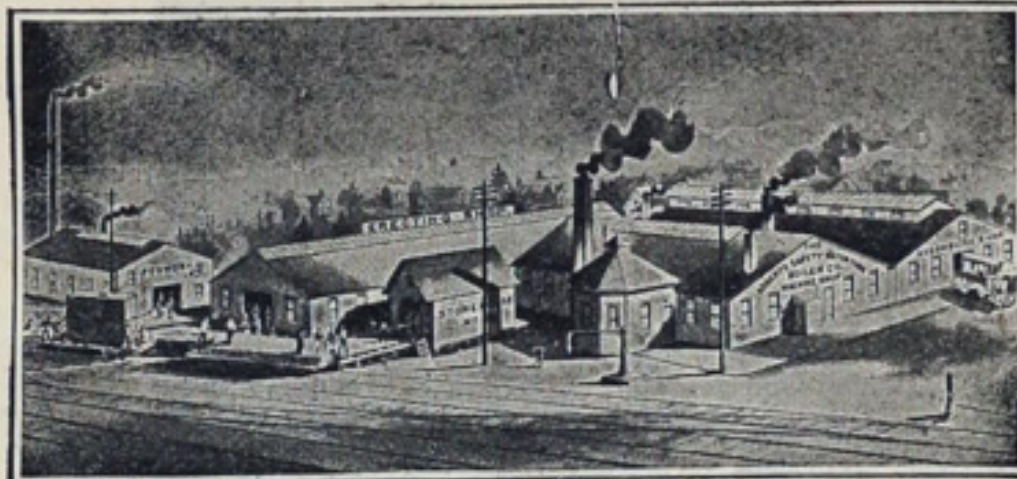
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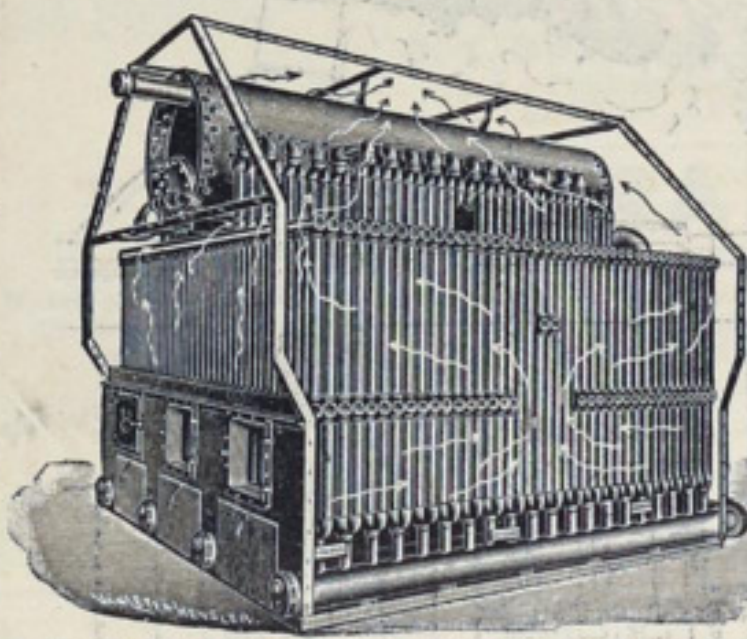
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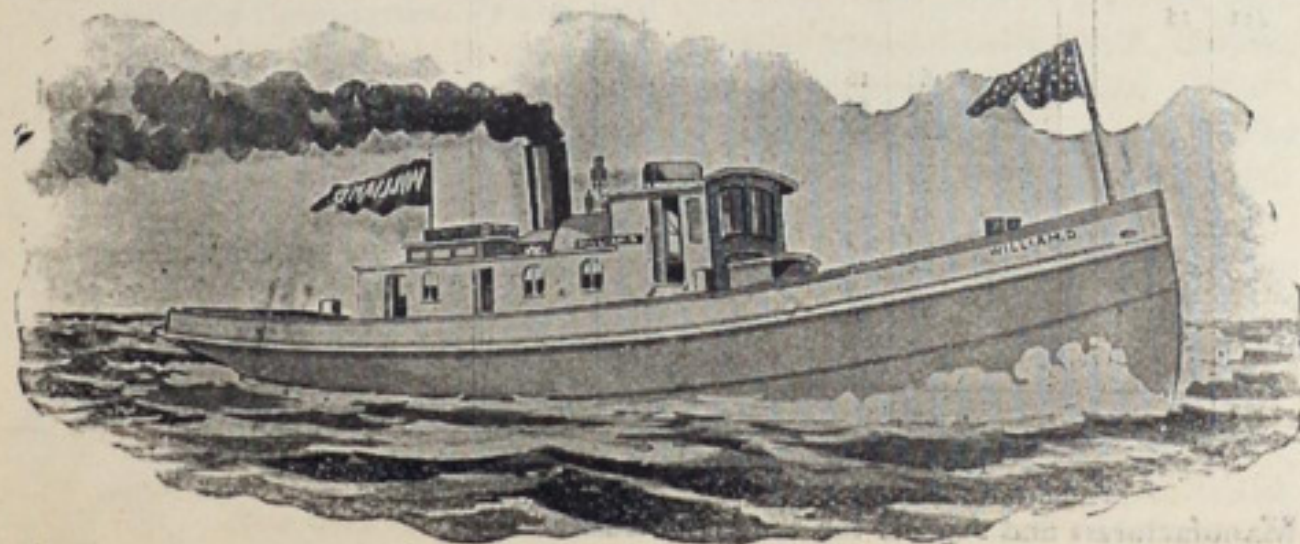
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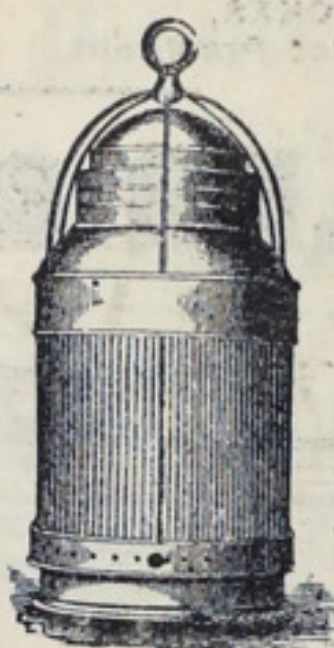
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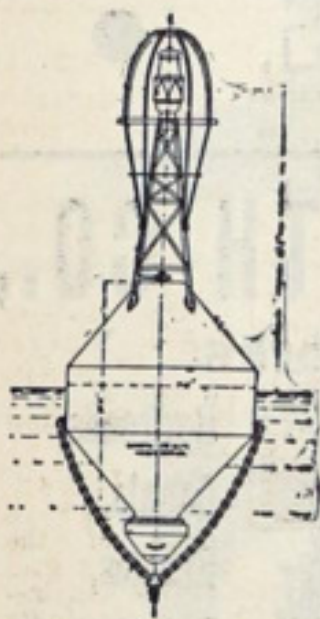
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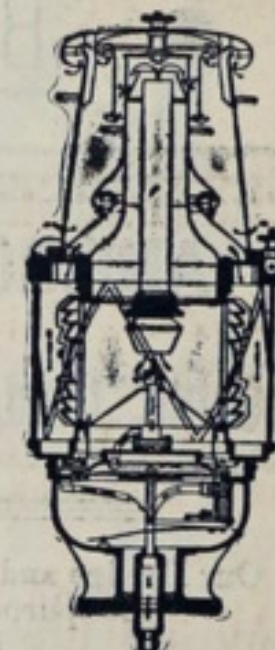
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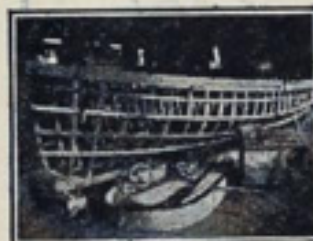
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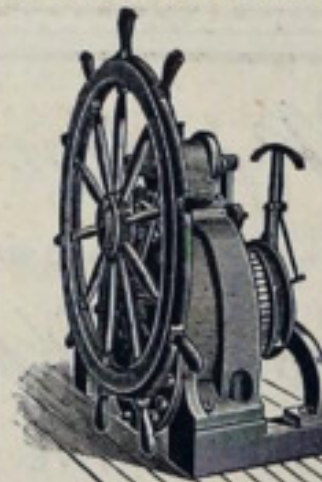


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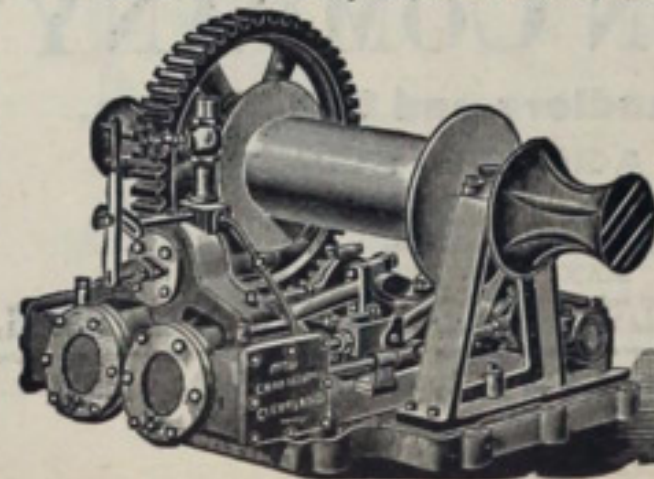
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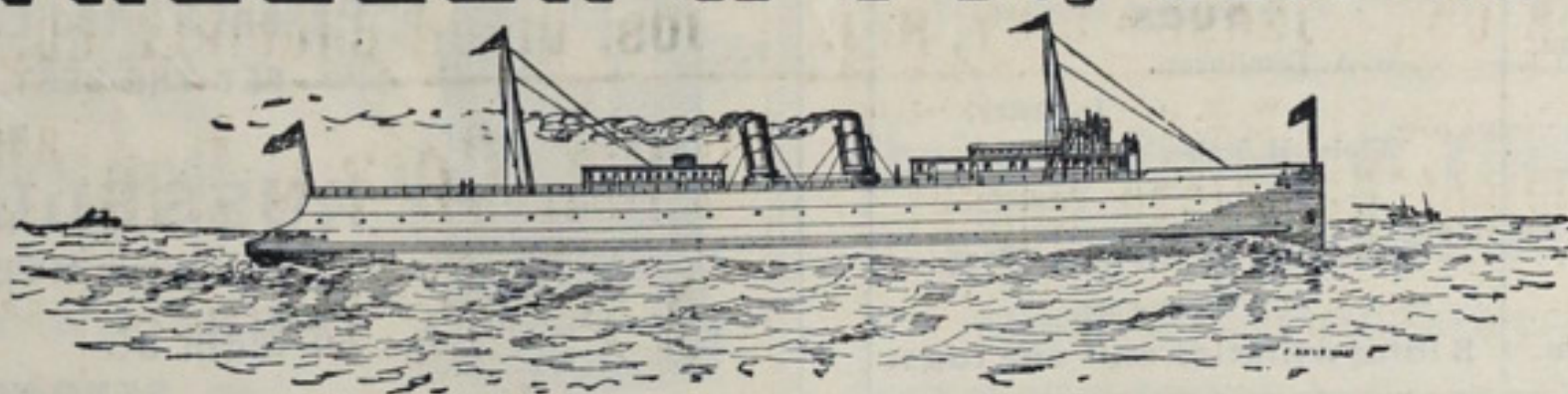
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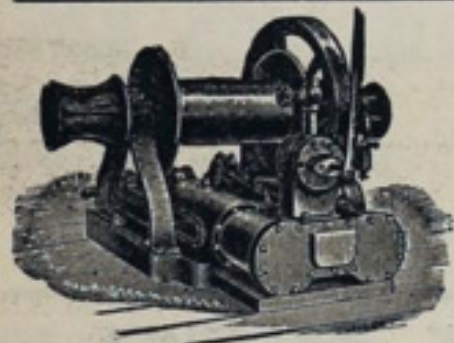
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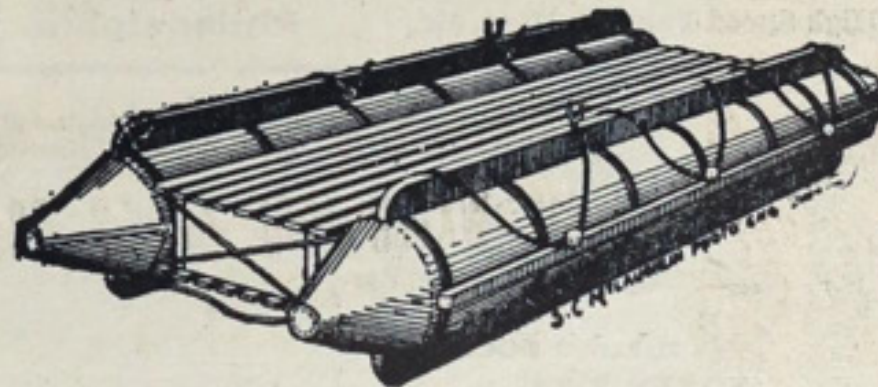
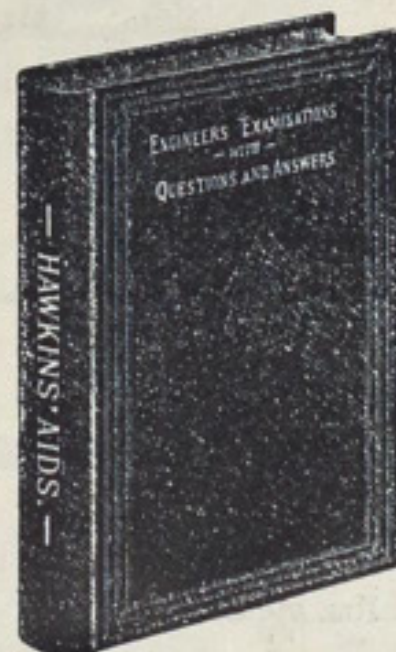
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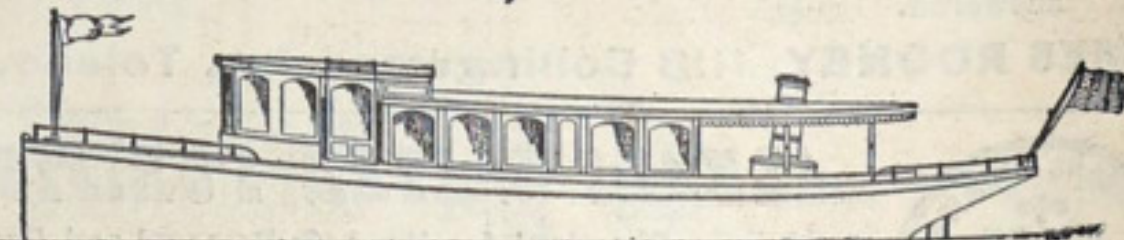
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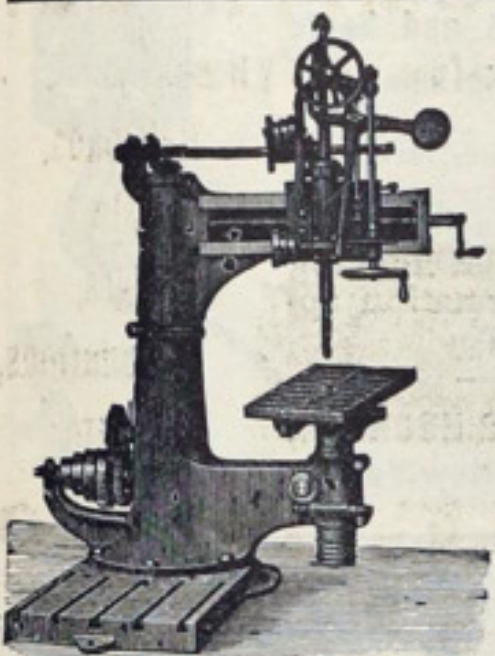
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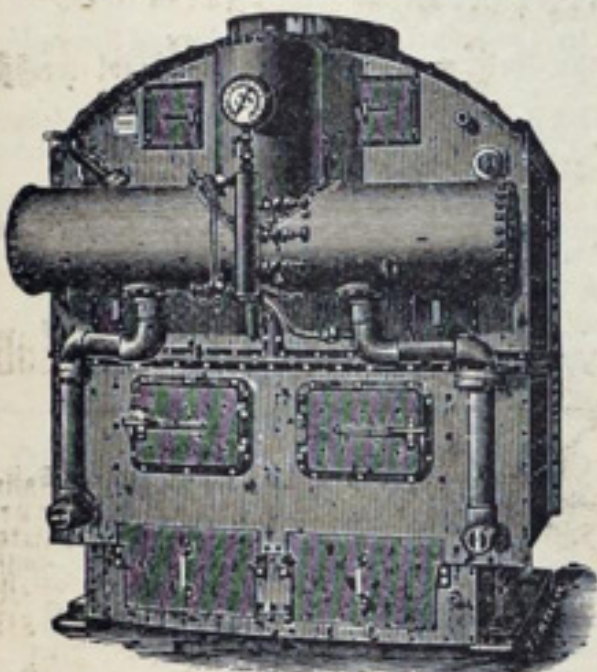
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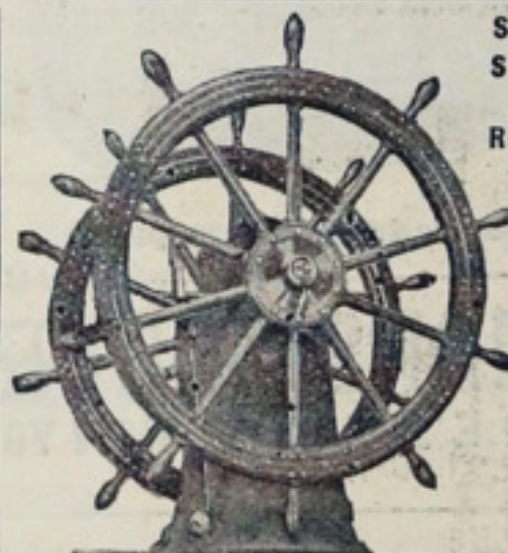
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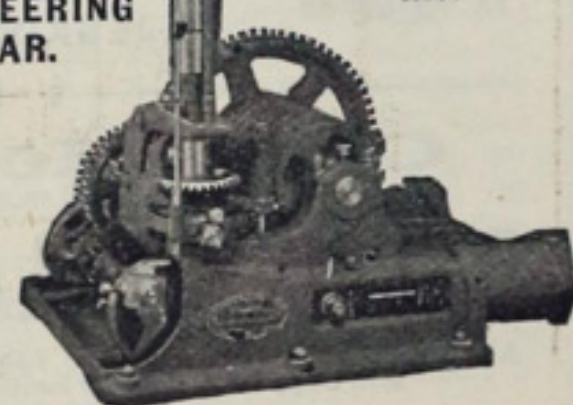


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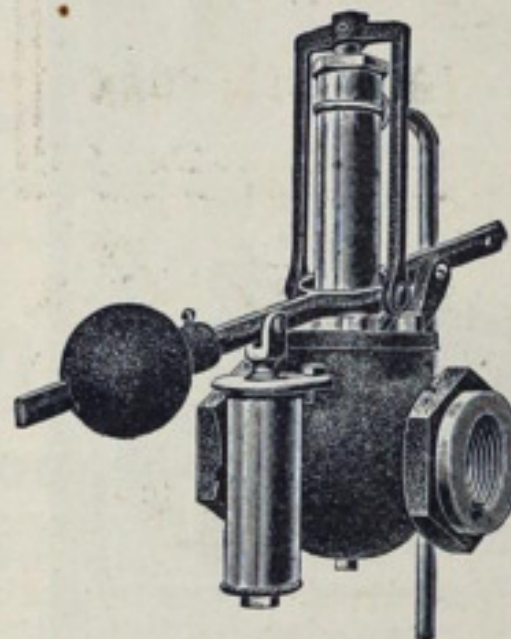
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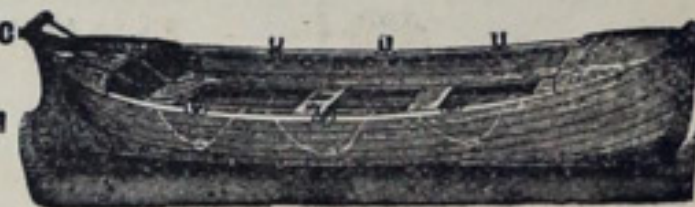
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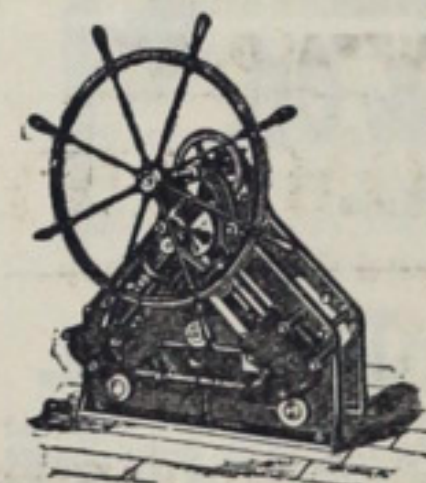
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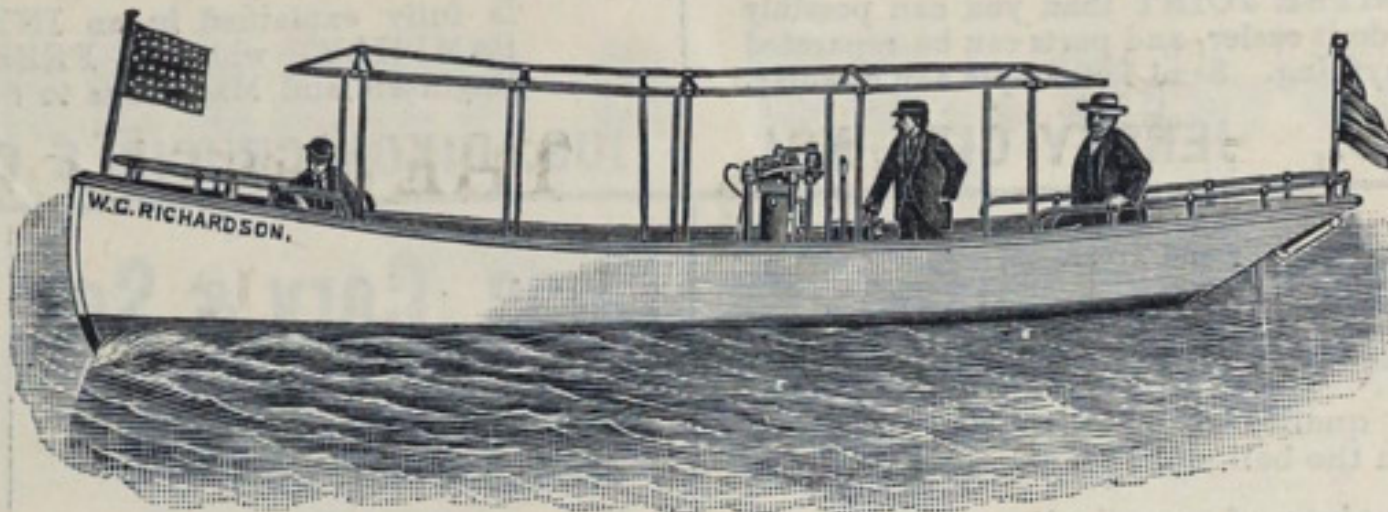


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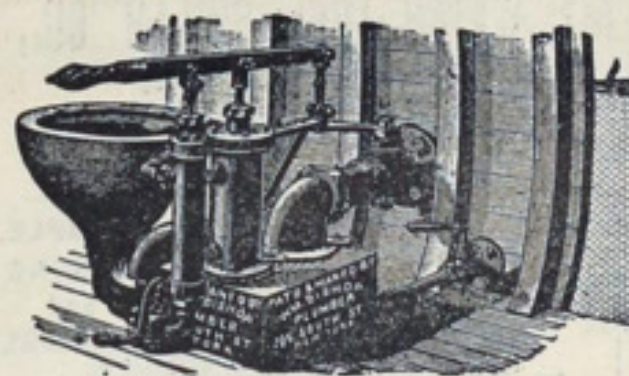
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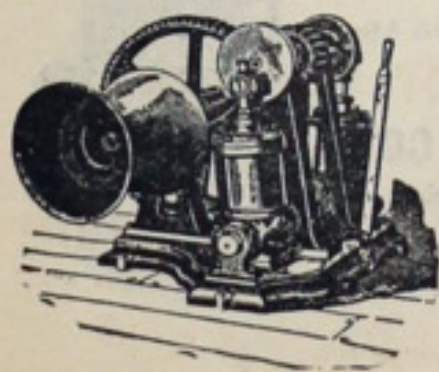
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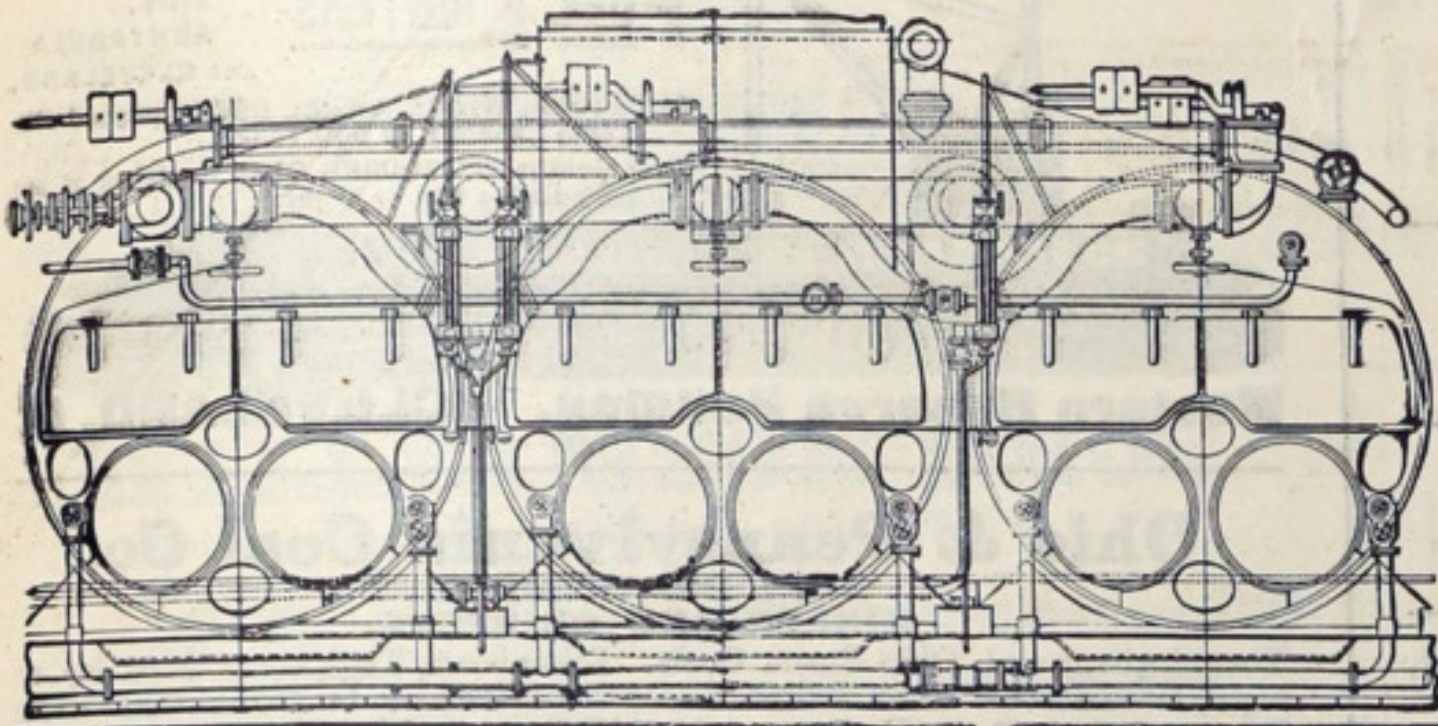
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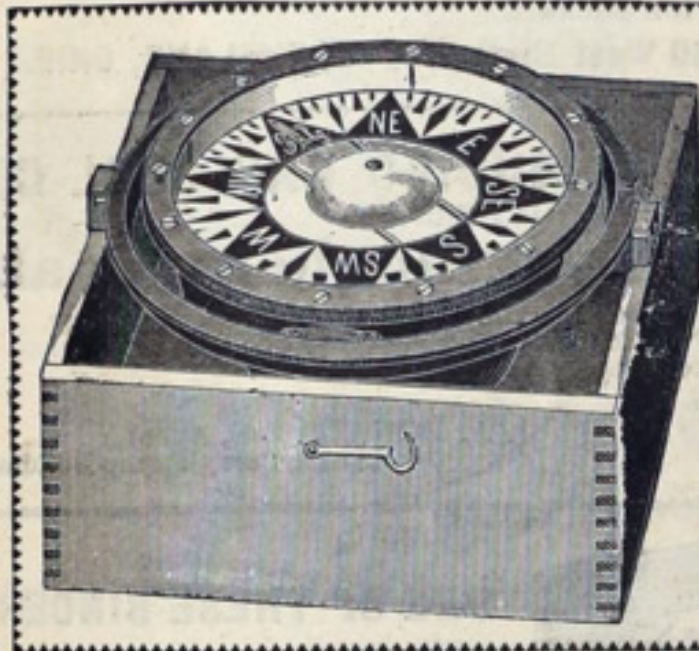
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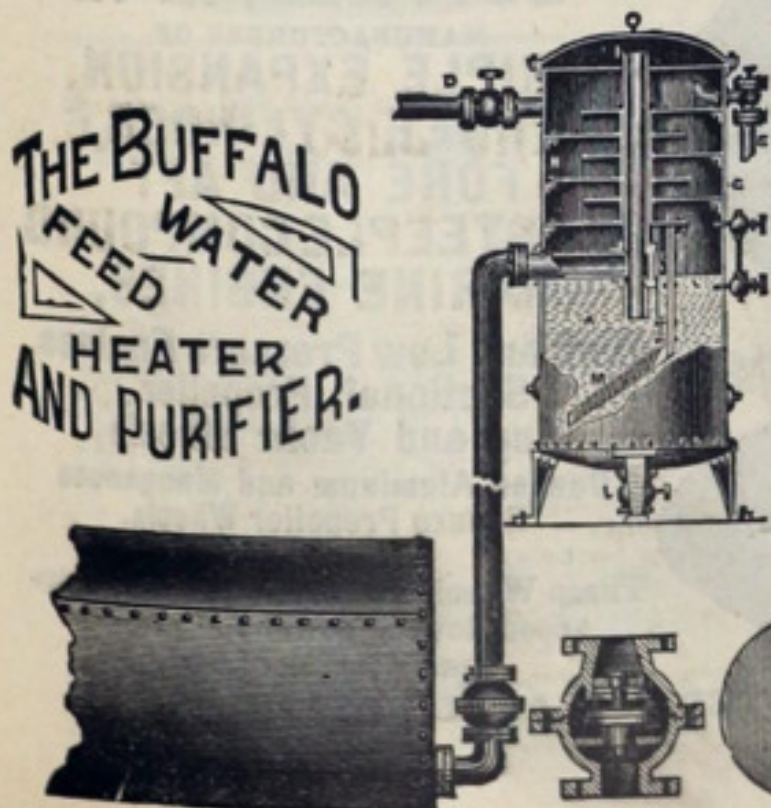
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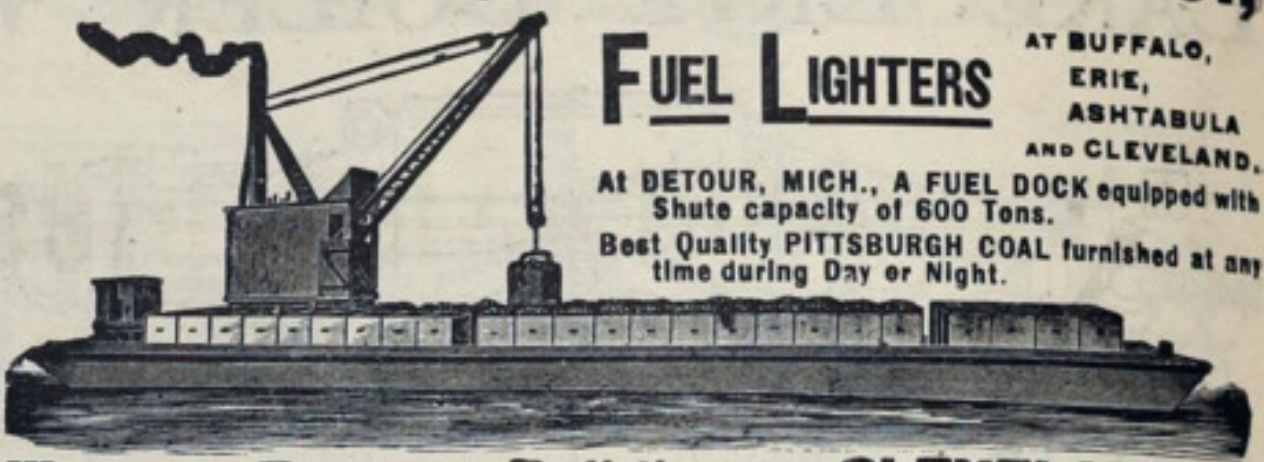
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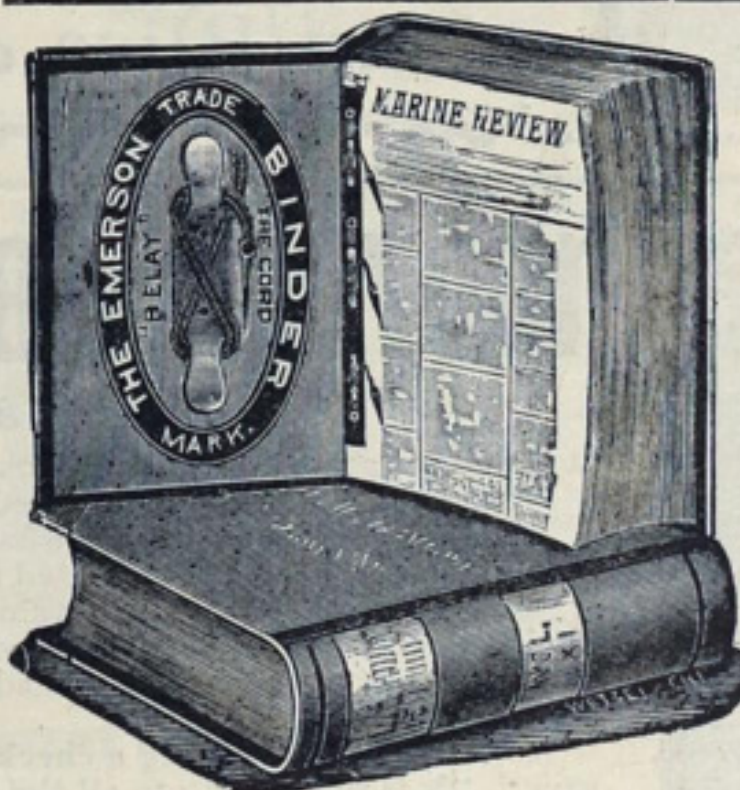
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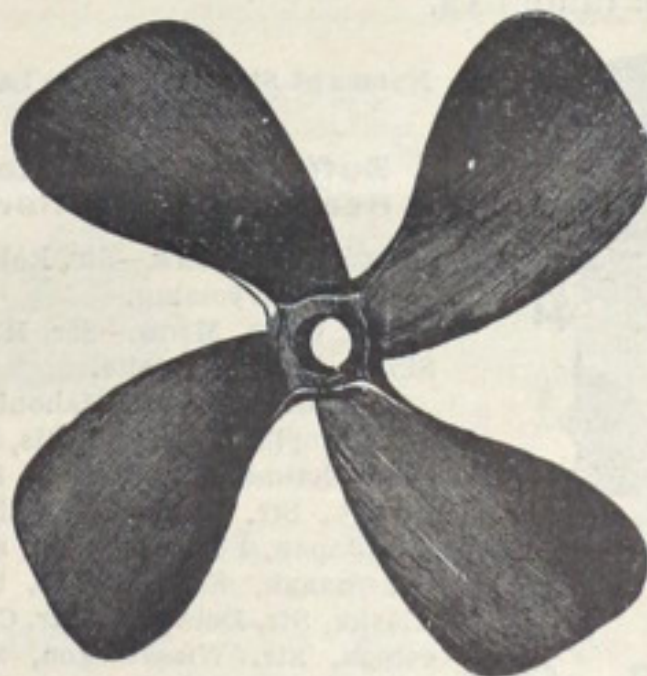
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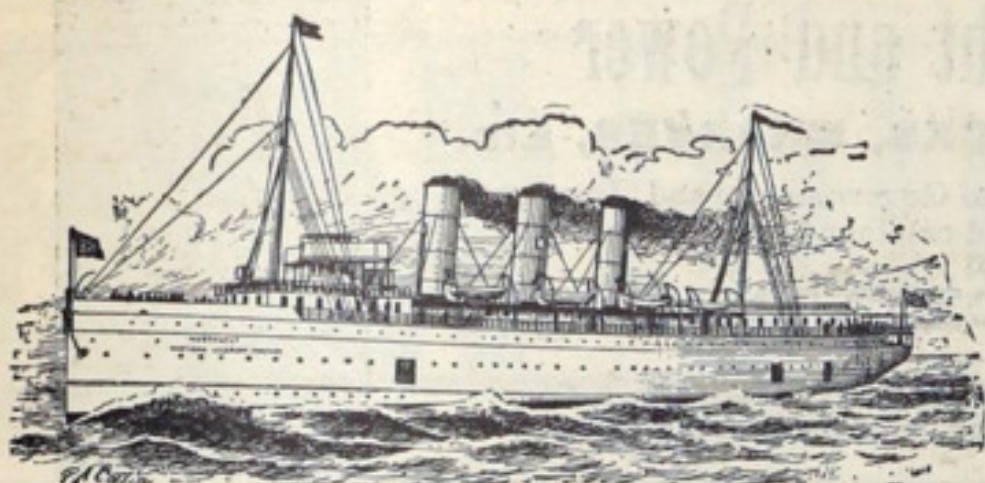
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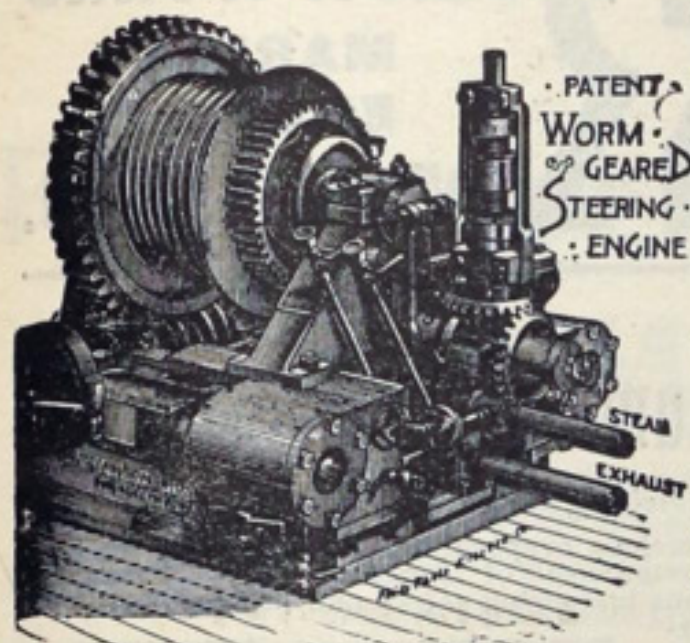
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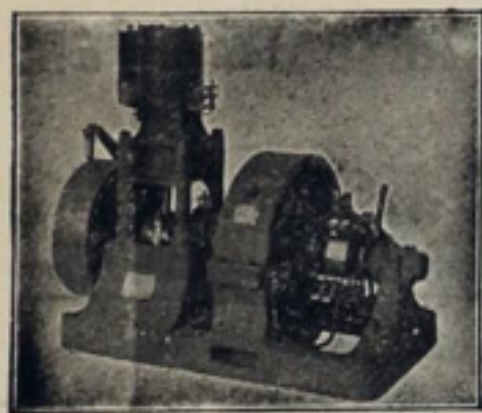
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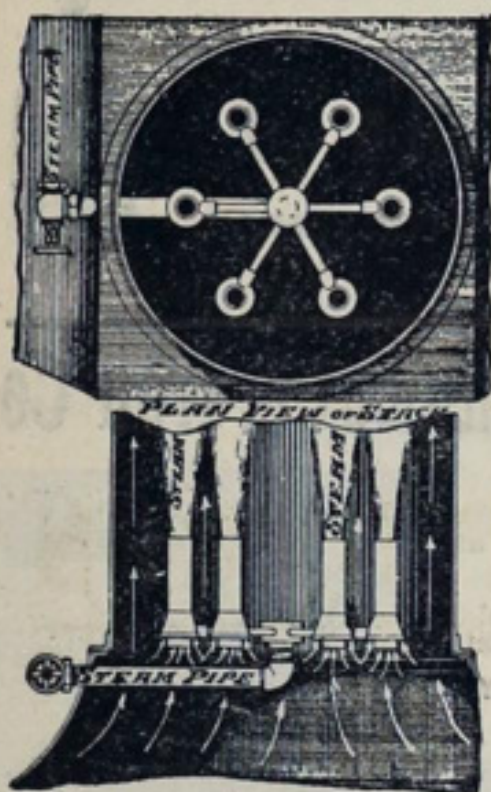
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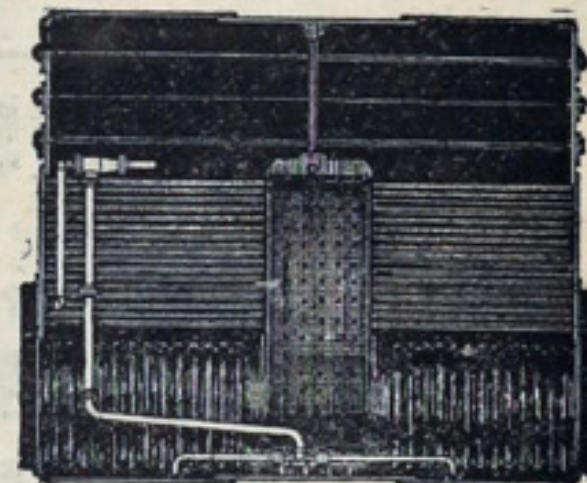
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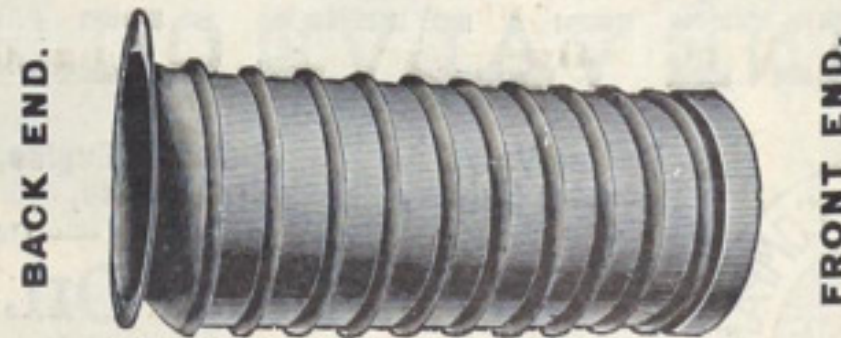
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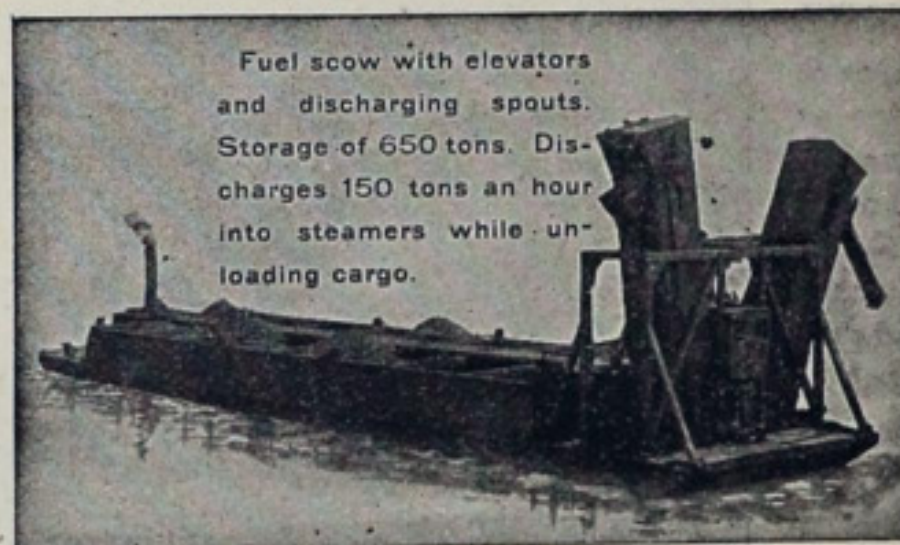
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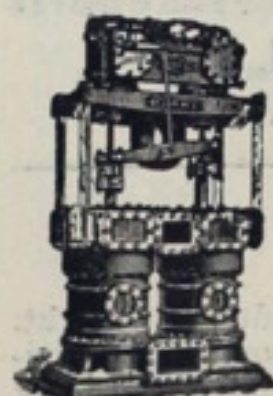
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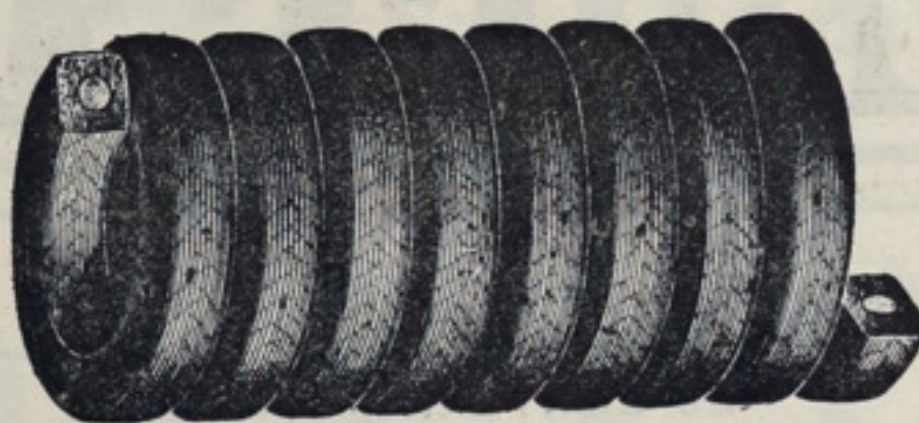
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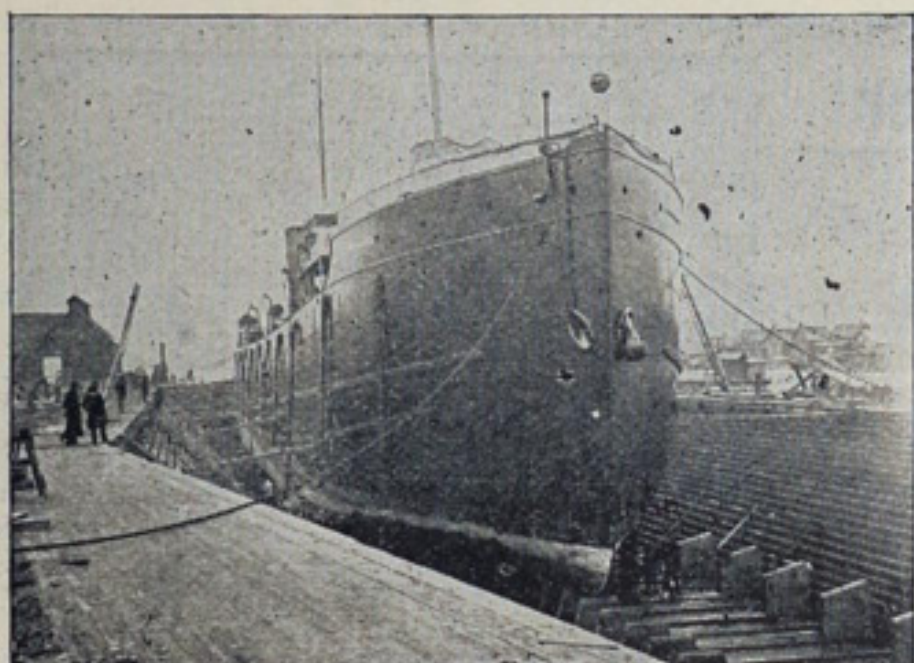
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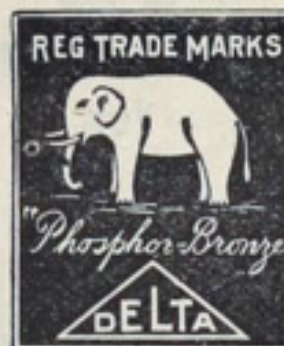
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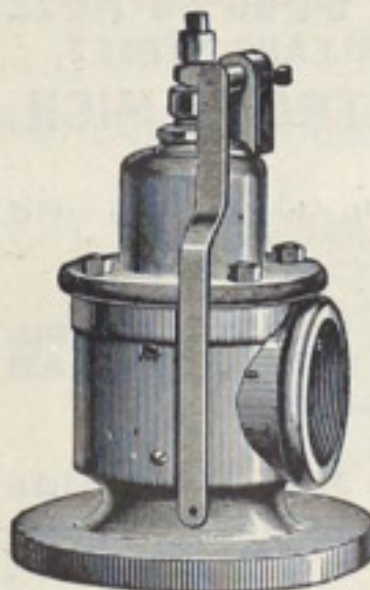
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